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1979 ANNUAL DISTRICT REPORT FOREST INSECT AND DISEASE SURVEY NEWFOUNDLAND

by: L.J. Clarke, E.C. Banfield, W.J. Sutton, D.M. Stone,
D.S. O'Brien, K.E. Pardy and G.C. Carew

NEWFOUNDLAND FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
INFORMATION REPORT N-X-183

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ABSTRACT

This report gives a detailed account of the major forest insects and diseases of Newfoundland and Labrador in 1979 and tabulates the other noteworthy pests of the region.

RÉSUMÉ

Ce rapport donne un exposé détaille des princicpaux insectes et maladies des forêts de Terre-Neuve et due Labrador en 1979. Il liste les autres agents nuisibles qui sont importants pour la region.

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INTRODUCTION

This report presents a review of this year's forest insect and disease conditions on the Island and in Labrador. Collections totalled 987 insect and 150 disease from twelve ranger districts (Fig. 1) and from visits and calls to property owners in the urban centres. Forest technicians also monitored, sampled and assessed damage caused by the spruce budworm. Sampling methods used during the summer and the results of monitoring budworm populations are presented in (Table 1). Assessment surveys were conducted from August to November to tabulate tree damage, egg-masses and overwintering larvae of the spruce budworm to forecast damage in 1980. In these surveys the assistance of the Provincial Forest Service providing aircraft time and technicians is greatly appreciated. The assistance of the wardens who collected samples in the National Parks is also acknowledged.

Permanent sample plots on the Avalon Peninsula were remeasured for height and diameter and phenology plots in western and central Newfoundland were measured weekly to monitor spruce budworm development and tree growth (Table 2).

Technicians also assisted in explaining exhibits during open house week at the Newfoundland Forest Research Centre and lectured forestry students from the College of Trades and Technology on insect and disease problems in Newfoundland.

Shrew trapping was conducted in October to find the population levels of this animal and to monitor any changes during the larch sawfly outbreak.

Spring and summer weather was warm and dry with above normal temperatures and low precipitation. Tree and insect development was at least two weeks earlier than in 1978. In Labrador temperatures were near normal throughout the summer, but precipitation was above normal for July and August.

Temperatures and precipitation for the past eight years are shown in Table 3.

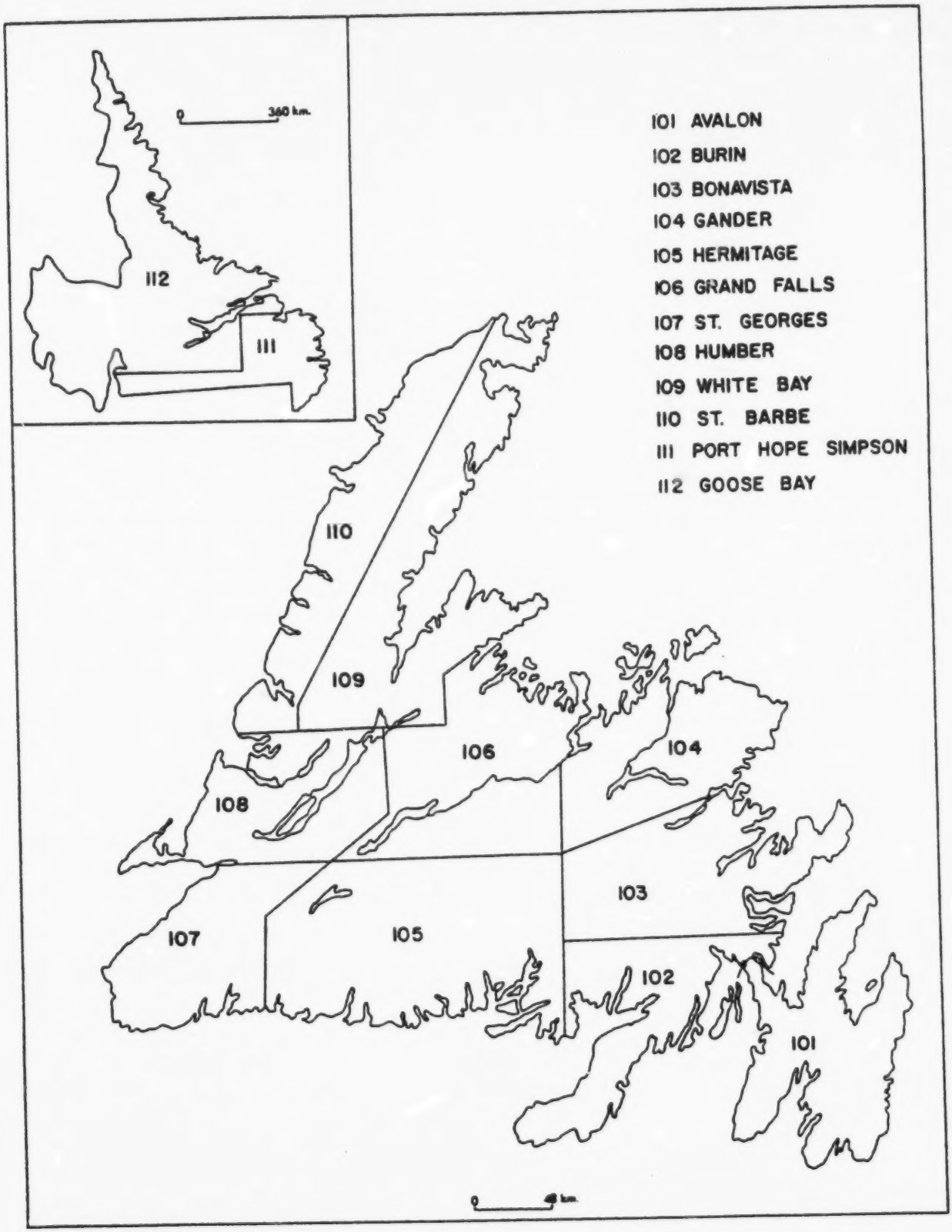


Fig. 1. Forest Insect and Disease Survey Districts.

Table 1.- Average number of spruce budworm larvae collected in ranger districts in 1979 by the beating method and branch sampling*

District	No. trees sampled	No. larvae collected	No. larvae per tree sample	No. branches sampled	No. larvae collected	No. larvae per branch
Eastern 101-102-103-104	38	3257	85.7	204	2652	13.0
Central 105-106	157	6739	42.9	87	1926	22.1
Western 107-108	229	5851	25.6	134	1265	9.4
Northern 109-110	102	1295	12.7	209	642	3.1
Total	526	17142	32.6	634	6485	10.2

*A 45 cm branch tip taken from the mid-crown of each of three trees.

Table 2.- Development of spruce budworm and balsam fir in 1978 & 1979 in Newfoundland.

		Dates of average growth								Larval development (instar)					
		Terminal				North lateral									
Location	Year	Bud burst	25%	50%	Total	Bud burst	25%	50%	Total	L2 larvae in buds	L3	L4	L5	L6	Pupation
Bottom Brook Road	1979		June 10	June 20	July 24		June 6	June 12	July 24					June 20	50% July 4
	1978	June 11	June 24	July 5	Aug. 4	June 11	June 20	June 27	July 30	June 12	June 14	June 24	July 2	July 10	20% July 1
Island Pond Road	1979	May 23	June 16	June 24	July 23		June 13	June 21	July 23						
Stag Lake Road	1979	May 21	June 12	June 23	July 23		June 6	June 12	July 10						
	1978	June 13	June 24	July 6	Aug. 2	June 13	June 21	June 29	July 21		June 17	June 24	July 3	July 10	
South Brook Valley	1979	May 21	Most defoliated							May 24		June 7		June 21	95% July 3
	1978	June 6	June 14	June 21	July 19	June 5	June 11	June 16	July 11	June 10	June 12	June 19	June 29	July 4	100% July 12
Jct. Cormack & Bonne Bay roads	1979	May 23	June 6	June 17	July 14	May 23	June 1	June 6	July 4		June 5		June 11		July 4
	1978	June 11	June 22	July 3	July 28	June 11	June 16	June 23	July 17		June 21		June 29	July 4	
Sheffield Lake	1979		June 9	June 20	July 13		June 3	June 9	July 3						
	1978	June 6	June 21	July 1	July 24	June 7	June 13	June 21	July 14			June 26	July 4		July 11
10 km N. of Baie Verte Jct.	1979	May 25	June 11	June 23	July 17	May 23	June 5	June 14	July 5		June 5	June 9	June 20	June 26	100% July 9
Average	1979	May 23	June 10	June 21	July 19	May 23	June 7	June 12	July 11	May 24	June 5	June 8	June 15	June 22	July 5
	1978	June 10	June 21	July 1	July 28	June 5	June 16	June 23	July 19	June 11	June 16	June 24	July 1	July 7	July 12

Table 3.- Temperatures and total precipitation for Newfoundland 1972-1979

Year	Location	Temperature (°C) May Min.	May Max.	June Min.	June Max.	July Min.	July Max.	August Min.	August Max.	Precipitation (cm) May	June	July	August
1972	St. John's	-7	26	1	26	4	28	6	25	10.44	9.75	1.93	11.81
1973	"	-2	19	-1	24	9	28	6	26	12.24	15.88	6.60	19.15
1974	"	-2	14	-1	28	1	26	5	24	10.87	6.12	9.12	14.40
1975	"	-2	22	0	26	2	29	5	27	22.02	11.18	1.93	14.53
1976	"	-2	22	0	28	-1	27	1	28	4.09	10.65	7.76	5.48
1977	"	-4	18	2	28	7	27	7	28	7.60	9.53	8.30	5.44
1978	"	-6	19	-1	26	7	26	4	29	4.77	5.72	8.31	4.96
1979	"	-2	23	-1	26	5	27	7	30	8.89	6.14	6.17	12.89
1972	Gander	-9	28	2	28	5	31	5	26	13.34	9.80	4.52	6.25
1973	"	-2	22	-1	28	8	29	5	24	9.83	14.63	5.92	16.21
1974	"	-3	14	-2	28	1	26	4	27	7.11	10.64	5.05	5.26
1975	"	-4	21	-2	25	5	34	5	29	17.93	2.44	6.20	6.03
1976	"	-3	25	-1	30	3	29	4	33	3.91	8.52	7.07	1.94
1977	"	-2	21	2	28	6	28	6	29	9.96	4.71	10.00	8.25
1978	"	-5	24	-2	27	7	29	4	29	3.94	5.84	7.00	5.59
1979	"	1	27	3	28	5	31	8	30	6.97	3.01	8.38	10.35
1972	Deer Lake	-8	24	-1	28	-1	31	-1	28	9.45	10.21	4.04	9.32
1973	"	-3	23	-3	27	3	31	3	28	6.65	15.29	8.69	13.28
1974	"	-4	14	-4	31	0	29	-1	31	3.56	2.21	8.99	6.27
1975	"	-6	22	-3	27	1	33	0	31	6.60	4.72	3.71	8.10
1976	"	-5	28	0	29	4	32	-2	33	7.18	5.60	3.02	4.88
1977	"	-7	24	-2	29	4	29	-3	29	7.54	4.64	2.05	8.49
1978	"	-5	21	-3	28	3	31	0	28	3.86	7.52	10.24	6.09
1979	"	0	26	-1	30	2	30	2	30	5.33	3.61	11.58	7.83
1972	Goose Bay	-15	16	-2	32	4	33	1	29	3.71	11.25	5.64	13.64
1973	"	-7	23	-1	31	6	33	2	28	3.33	11.30	12.06	6.53
1974	"	-5	14	-1	33	1	31	1	30	3.83	5.94	6.20	8.38
1975	"	-8	16	-1	27	4	37	2	27	1.93	7.62	6.83	6.17
1976	"	-4	21	-1	27	4	29	0	33	2.96	2.00	9.40	14.25
1977	"	-6	18	-1	31	5	32	6	30	11.61	5.80	9.63	10.69
1978	"	-7	26	-4	29	3	30	4	27	5.68	15.85	9.07	9.54
1979	"	-1	32	1	33	2	33	2	29	8.30	10.91	14.11	14.58

The spruce budworm and spruce coneworm continued to be the most serious pests of forest stands on the Island. Hemlock looper infestation occurred in isolated patches in western and central Newfoundland as forecast in the 1978 report. Balsam woolly aphid populations increased from the Codroy Valley to Stephenville and separate infestations continued at about the same level as 1978 in eastern Newfoundland. An outbreak of larch sawfly was recorded in western Newfoundland for the first time since 1976 and the outbreak in Labrador continued around Lake Melville for the fifth consecutive year. Larch casebearer population levels remained high on the Avalon Peninsula, the Terra Nova National Park and along the Kings Point Road. New infestations were reported near Sheffield Lake. Larch bark beetles continued to cause severe damage and tree mortality to weakened tamarack stands along the Trans Canada Highway and secondary roads throughout central Newfoundland and in isolated patches in the Codroy Valley and the Avalon Peninsula.

Population levels of the European pine sawfly remained high in the St. John's area but caused only light defoliation to pine plantations near Confederation Building and at Windsor Lake. The spruce budmoth and balsam twig aphid population levels were high in eastern Newfoundland this year but caused light damage. The birch casebearer continued to be the most serious defoliator of hardwood trees. The boundary of the outbreak extended throughout the Avalon Peninsula and now covers the entire Island. The satin moth continued to cause severe defoliation of poplars in the St. John's area for the third consecutive year. Other hardwood defoliators such as the birch leafminer, aspen leaf roller and leafminer, mountain ash sawfly, uglynest caterpillar and the fall webworm were found in light to moderate infestations and are recorded and tabulated as insects per tree in "Other Noteworthy Insects" in this report.

Important forest diseases found in the Province included Scleroderris canker, recorded for the first time, Armillaria root rot found on Scots pine at North Pond; stem and branch cankers common on ornamental hardwoods in the St. John's area; witches' broom of black spruce in central and western Newfoundland; shoot and leaf blight of trembling aspen throughout central and western Newfoundland and in the Goose Bay area of Labrador; Dothichiza canker of lombardy poplar across the Island; needle rusts of conifers in scattered patches in areas of central and western Newfoundland and in the Goose Bay area of Labrador; frost damage of balsam fir in western Newfoundland and winter drying of Scots pine at Windsor Lake near St. John's.

IMPORTANT FOREST INSECTS

Spruce Budworm, Choristoneura fumiferana (Clem.) — Spruce budworm larval feeding on balsam fir began about two weeks earlier than in 1978. Survival of budworm larvae in 1979 was about 25 percent higher than in previous years accounting for a higher level of defoliation than was

expected in some areas. Larval sampling during early summer and aerial defoliation surveys in late summer showed an increase in the moderate and severe defoliation in productive forests on the Island to 972 600 ha from 794 000 ha in 1978. However, the total defoliation, light, moderate and severe decreased in 1979 to 1 251 300 ha from 1 341 800 ha in 1978. The moderate and severe defoliation in western Newfoundland occurred in localized areas from Doyles to Highlands, Flat Bay and Barachois brooks, Port au Port Peninsula, Fox Island River, North shore of Bay of Islands, Grand Lake to Deer Lake and Kings Point. Defoliation was more extensive in central and eastern Newfoundland, where the main outbreak occurred. This outbreak included all the area from Halls Bay to Red Indian Lake east to Random Island, including the Bay d'Espoir area, the Bonavista and the Avalon peninsulas (Table 4, Fig. 2).

In Labrador no budworm larvae or defoliation was recorded during the summer indicating a collapse of the outbreak.

Damage of Mature Stands

Aerial and ground tree damage assessment was conducted in August to determine the area and volume of dead and damaged stands. The stands were classified as in 1978 and are described in last year's report. Results of these surveys showed that tree mortality had increased in areas infested in 1979 and areas previously infested. The total area of merchantable stands with dead and dying trees increased from about 300 400 ha in 1978 to 517 800 ha in 1979 (Table 5, Figs. 3, 4, 5, 6 & 7). These stands contained about 10 257 000 m^3 of dead trees, representing an increase of more than 3 700 000 m^3 since 1978. Most of these stands were also examined to determine the age since death. Data showed that of the total of 8 701 200 m^3 of dead wood ground checked, about 15% was dead for more than five years and 58%, 21%, 5% and 1% was dead for one, two, three and four years respectively. The volume of timber dead for more than five years includes stands damaged by previous insect outbreaks, e.g. balsam woolly aphid and hemlock looper. The volume of blowdown timber was estimated at 12% of the 8 701 200 m^3 of dead wood examined. In Labrador there was no current budworm defoliation and the previous damage reported in the 1978 report did not increase appreciably in 1979.

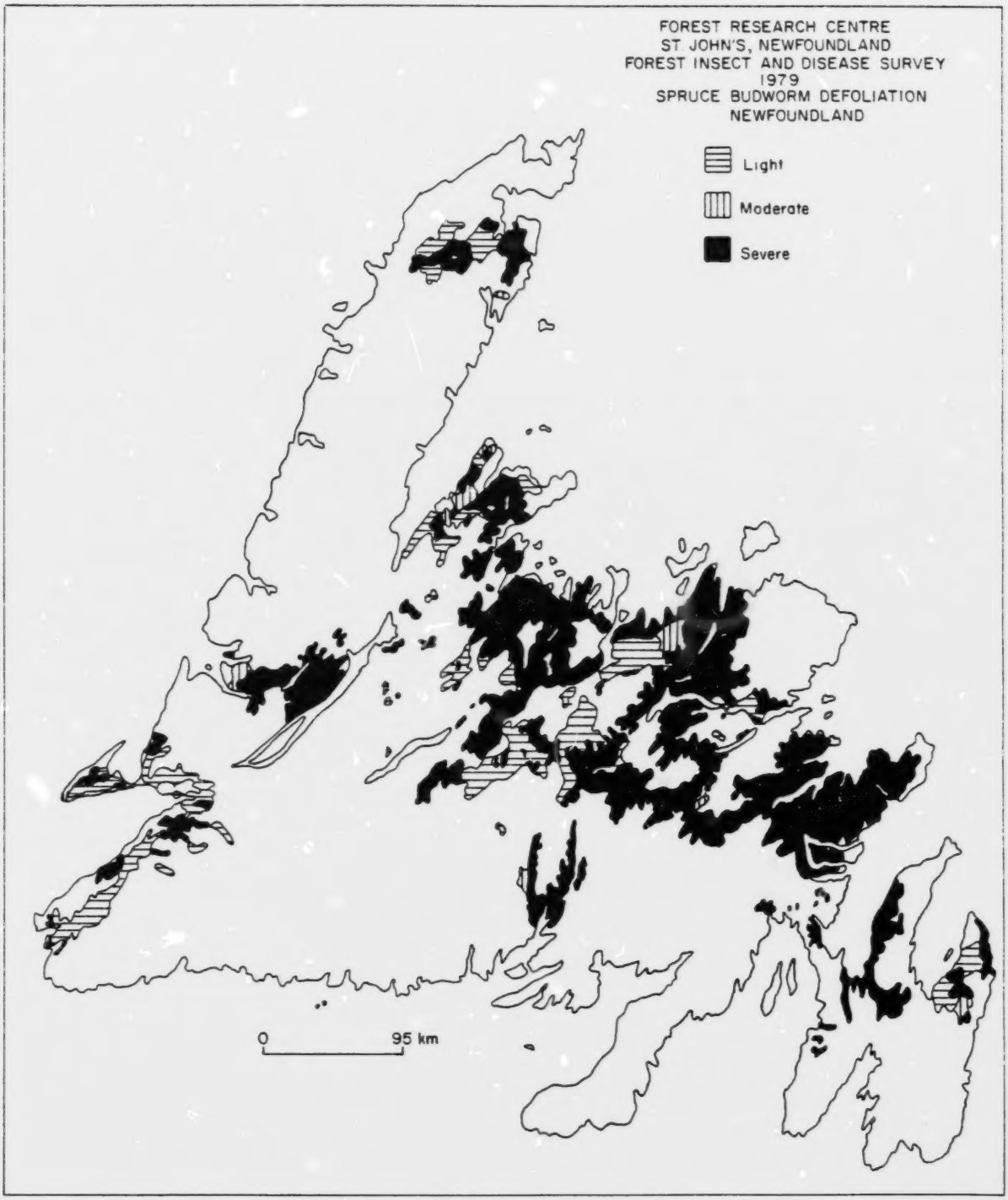
Damage To Young Stands

Damage assessment of immature stands of balsam fir were also conducted in 1979. The total area of very severely damaged submerchantable stands containing tree mortality increased from 32 000 ha in 1978 to 46 600 ha in 1979. However, moderately and severely damaged stands decreased from 356 000 ha in 1978 to about 400 ha in 1979. This decrease was due in part to recovery of young stands where budworm populations collapsed and in part to the fact that some of the young stands reached merchantable size and are tabulated as such this year. Ground surveys

Table 4.- 1979 spruce budworm defoliation by management unit in productive forest (hectares).

Management unit no.	L	M	S*	Total
1	165	-	56 221	56 386
1A	14 081	2 257	13 191	29 529
2	-	-	130 580	130 580
3	8 183	-	991	9 174
4	790	1 669	73 720	76 179
5	6 967	3 356	111 485	121 808
6	16 820	-	79 776	96 596
7	2 100	1 318	30 216	33 634
8	12 143	10 798	81 212	104 153
9	36 266	14 374	121 517	172 157
10	2 926	-	44 258	47 184
11	47 022	1 307	32 356	80 685
12	17 357	413	35 429	53 199
14	73 141	842	27 899	101 882
15	13 071	8 565	39 048	60 684
16	2 063	-	11 537	13 600
17	947	-	1 750	2 697
18	24 666	1 058	35 498	61 222
Hectares	278 708	45 957	926 684	1 251 349
Acres	688,705	113,557	2,289,883	3,092,145

*L = Light
M = Moderate
S = Severe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FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DEFOLIATION
NEWFOUNDLAND
Light
Moderate
Severe
0
95 km

FIG. 2

Table 5.- Spruce budworm damage assessment in productive, merchantable stands in 1979. Volume based on 2.41 m^3/cord.

Management unit no.	Ownership	Area and Volume Affected											
		A (Dead)*				B (Moribund)*				C (Very severe damage)*			
		Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)
1	Crown	-	-	-	-	8794	267832	49870	128884	18721	744977	-	152175
2	"	-	-	-	-	432	39487	-	23693	24661	2006253	1116	464773
4	"	-	-	-	-	4320	286556	71073	74120	-	-	-	-
4	Price	-	-	-	-	15837	990471	322947	355215	6577	498352	45961	145699
5	Crown	-	-	-	-	2522	239795	76045	37815	-	-	-	-
5	Bowater	776	78580	39290	7857	529	53548	17017	21926	778	68699	4205	4205
5	Price	-	-	-	-	7336	618346	204643	178024	1348	130285	9657	8736
6	Crown	-	-	-	-	385	17897	6442	4295	-	-	-	-
6	Bowater	2669	270238	203763	21174	11943	1082545	410175	189756	15493	1476033	170758	366079
6	Price	-	-	-	-	1321	133726	40117	48142	1376	139298	-	13930
7	Crown	1384	68846	59544	5651	14826	911491	130258	493999	4906	263073	25691	57797
8	"	4991	162256	103269	27067	6873	509773	144670	191212	10529	540238	42594	136731
8	Bowater	1245	34733	18241	2933	2378	222291	77802	48904	-	-	-	-
8	Price	-	-	-	-	1133	74264	24293	8690	-	-	-	-
9	Crown	368	29619	14809	11192	15882	1200168	206096	823379	2598	105211	3160	19991
9	Bowater	2908	310083	218257	67861	7527	614270	92231	240573	4001	463395	3410	131364
9	Price	3191	280898	140448	103577	10443	890027	300917	218269	-	-	-	-
10	Crown	-	-	-	-	1027	31316	10645	1253	-	-	-	-
10	Price	2059	91982	51581	35229	8062	425772	116786	85312	13600	733177	77510	180752
11	"	-	-	-	-	11613	1101045	261150	162306	5531	362141	35521	90997
12	"	5145	360319	190455	129935	13280	987611	256038	356490	-	-	-	-
13	"	2159	168049	127925	6314	2449	195012	66610	85015	286	25399	-	9177
14	Crown	18381	1621838	1037859	413792	20070	1563639	303462	890244	11215	924221	21671	334036
14	Bowater	10095	888678	600423	167170	22639	1767455	539893	723306	13501	1125600	161424	308911
14	Private	-	-	-	-	248	20167	4839	6454	1224	102030	12243	35711
15	Crown	3522	377580	218997	154809	991	83579	24061	50227	-	-	-	-
15	Bowater	24882	2030227	1228604	396525	12366	962805	194227	385506	19716	1552720	150483	438960

Cont'd ...

Table 5 - Concluded

Management unit no.	Ownership	Area and Volume Affected											
		A (Dead)*				B (Moribund)*				C (Very severe damage)*			
		Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)	Total area (ha)	Total vol. (m^3)	Dead vol. (m^3)	Dying vol. (m^3)
16	Crown	578	19707	7649	4957	12296	908664	246485	261430	6004	528889	23736	107067
16	Bowater	3701	293345	219845	8915	4462	392702	103469	72490	2331	201553	13482	40257
17	Crown	2995	84350	48947	23305	1266	75385	24418	28679	605	36054	819	8850
17	Bowater	6107	400062	241672	84430	-	-	-	-	1844	158964	12559	30908
18	Crown	-	-	-	-	-	-	-	-	7946	425905	51109	114993
18	Bowater	-	-	-	-	-	-	-	-	2697	144542	17345	39028
	GMNP	-	-	-	-	13493	896703	204766	405454	3908	302522	36046	80530
	TNNP	-	-	-	-	2119	180172	30988	60542	413	36873	2212	8850
	Crown	32220	2364196	1491074	640773	89685	6135582	1293527	3009230	87186	5574819	169895	1396412
	Bowater	52384	4305947	2770095	756863	61845	5095617	1434813	1682462	60361	5191506	533666	1359712
	Price	12554	901248	510409	275056	71474	5416275	1593502	1497463	28719	1888652	168649	449291
	GMNP	-	-	-	-	13493	896703	204766	405454	3908	302522	36046	80530
	TNNP	-	-	-	-	2119	180172	30988	60542	413	36873	2212	8850
	Private	-	-	-	-	248	20167	4839	6454	1224	102030	12243	35711
Total Island		97158	7571391	4771578	1672692	238864	17744517	4562435	6661605	181810	13096403	922711	3330506
Total Island		240084	3141656	1979908	694063	590244	7362870	1893126	2764151	449262	5434192	382868	1381953

(Area in acres
Vol. in cords)

*
A (Dead): 50% or more of total volume of stand dead.
B (Moribund, unlikely to recover): 20% to 49% of total volume of stand dead or more than 49% of total volume dying.
C (Very severe damage, likely to recover): 5 to 19% of total volume dead or 5 to 49% of total volume dying.

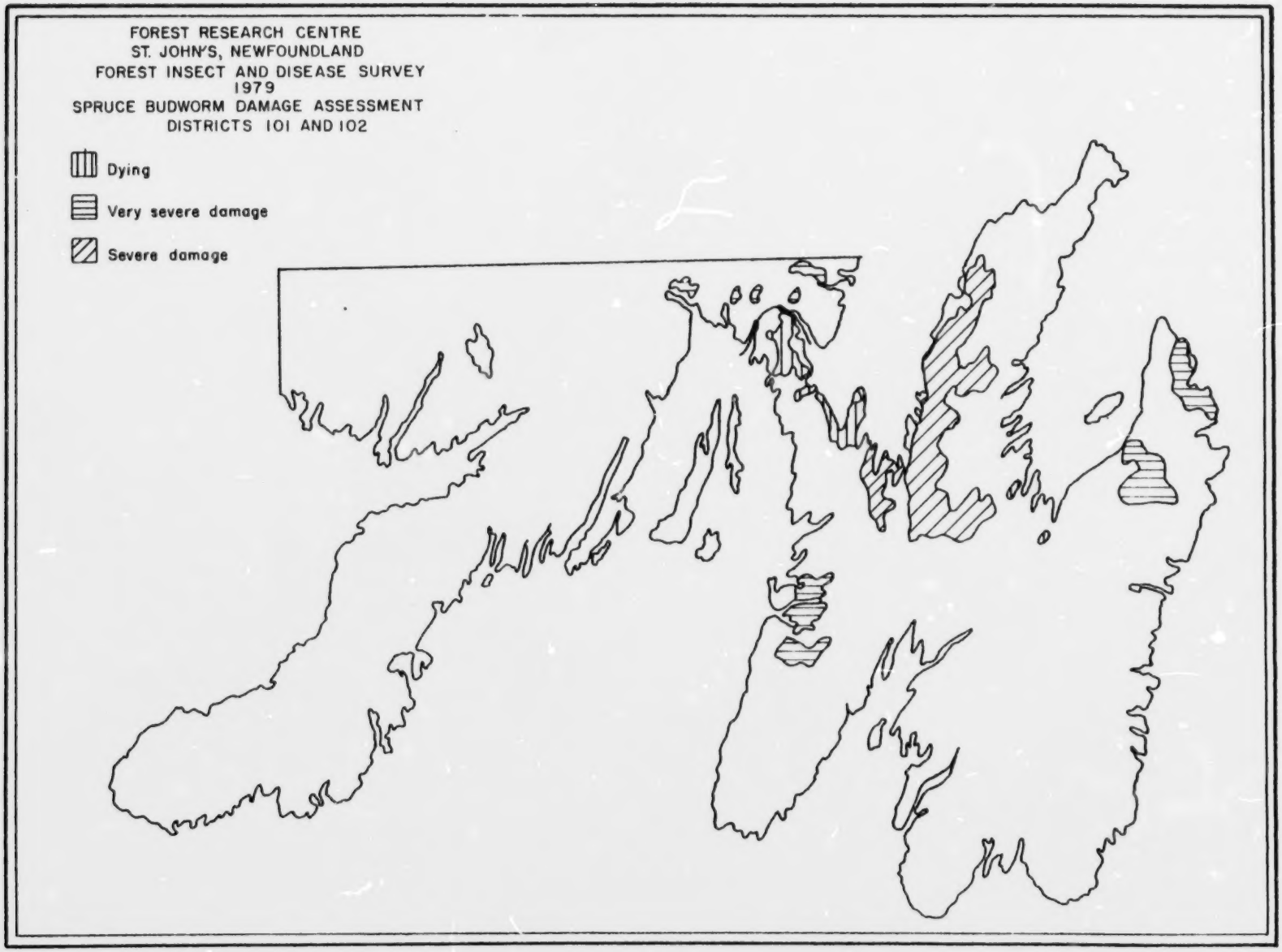
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 101 AND 102
Dying
Very severe damage
Severe damage

FIG. 3

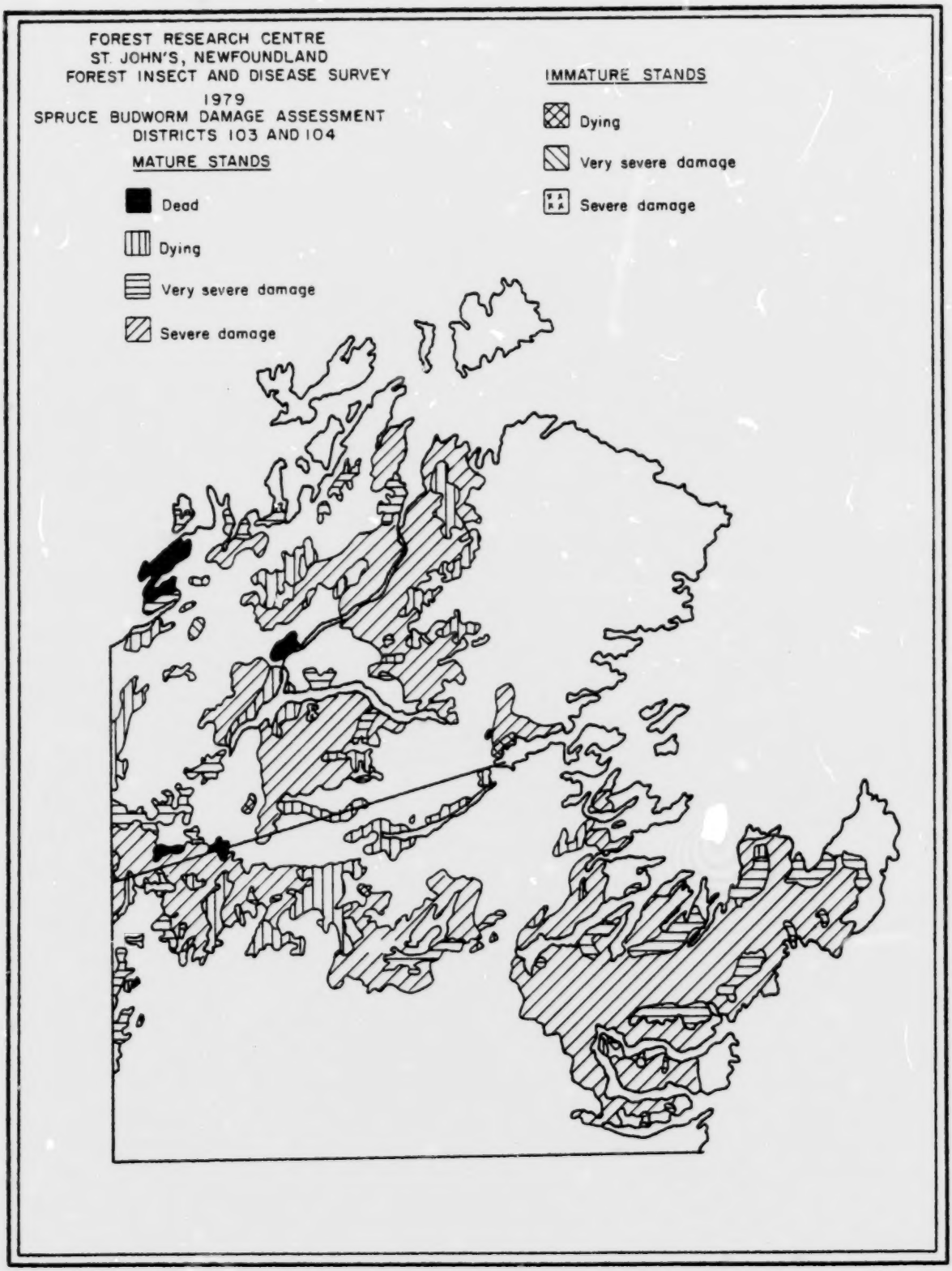
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 103 AND 104
MATURE STANDS
Dead
Dying
Very severe damage
Severe damage
IMMATURE STANDS
Dying
Very severe damage
Severe damage

FIG. 4

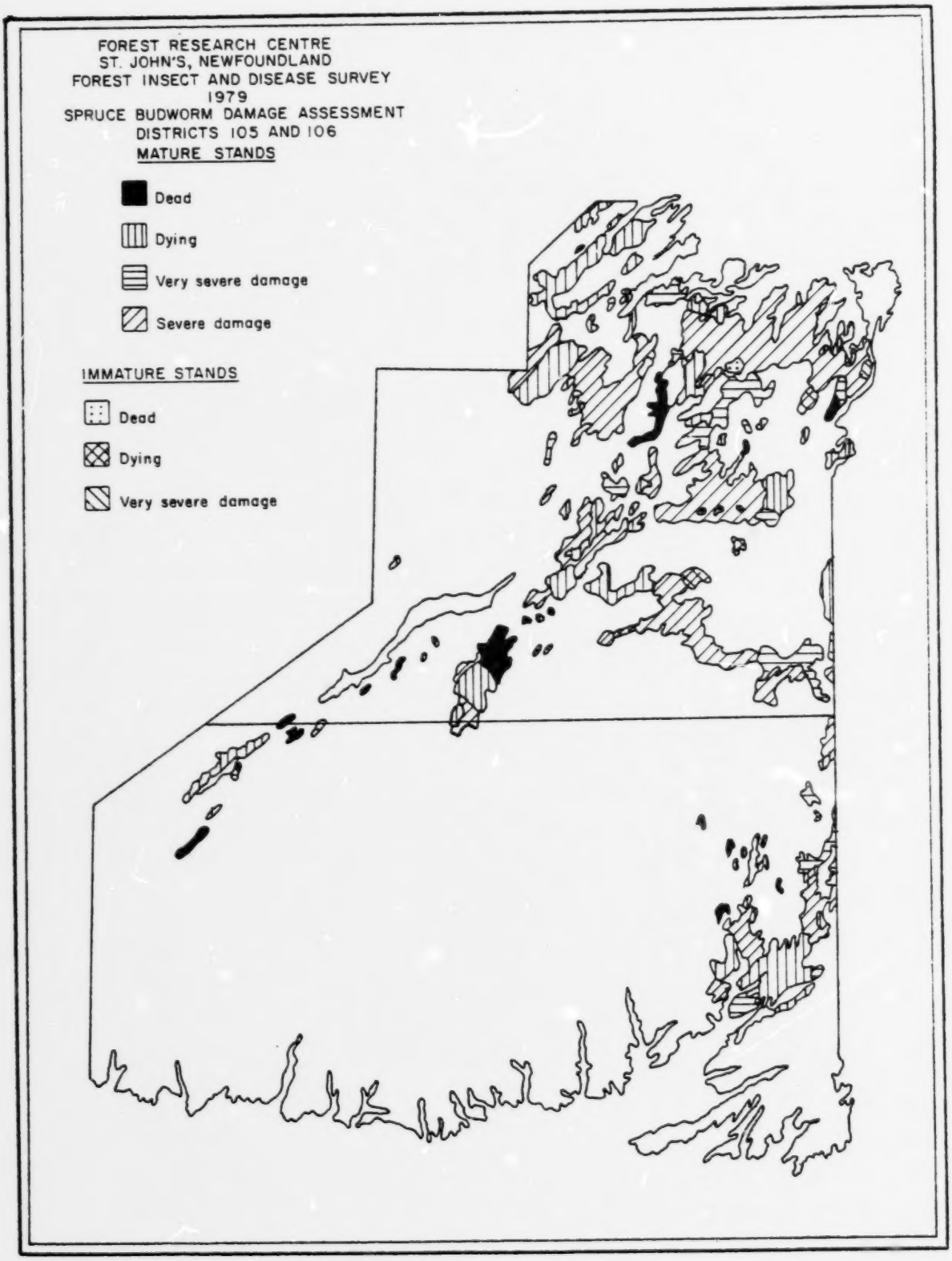
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 105 AND 106
MATURE STANDS
Dead
Dying
Very severe damage
Severe damage
IMMATURE STANDS
Dead
Dying
Very severe damage

FIG. 5

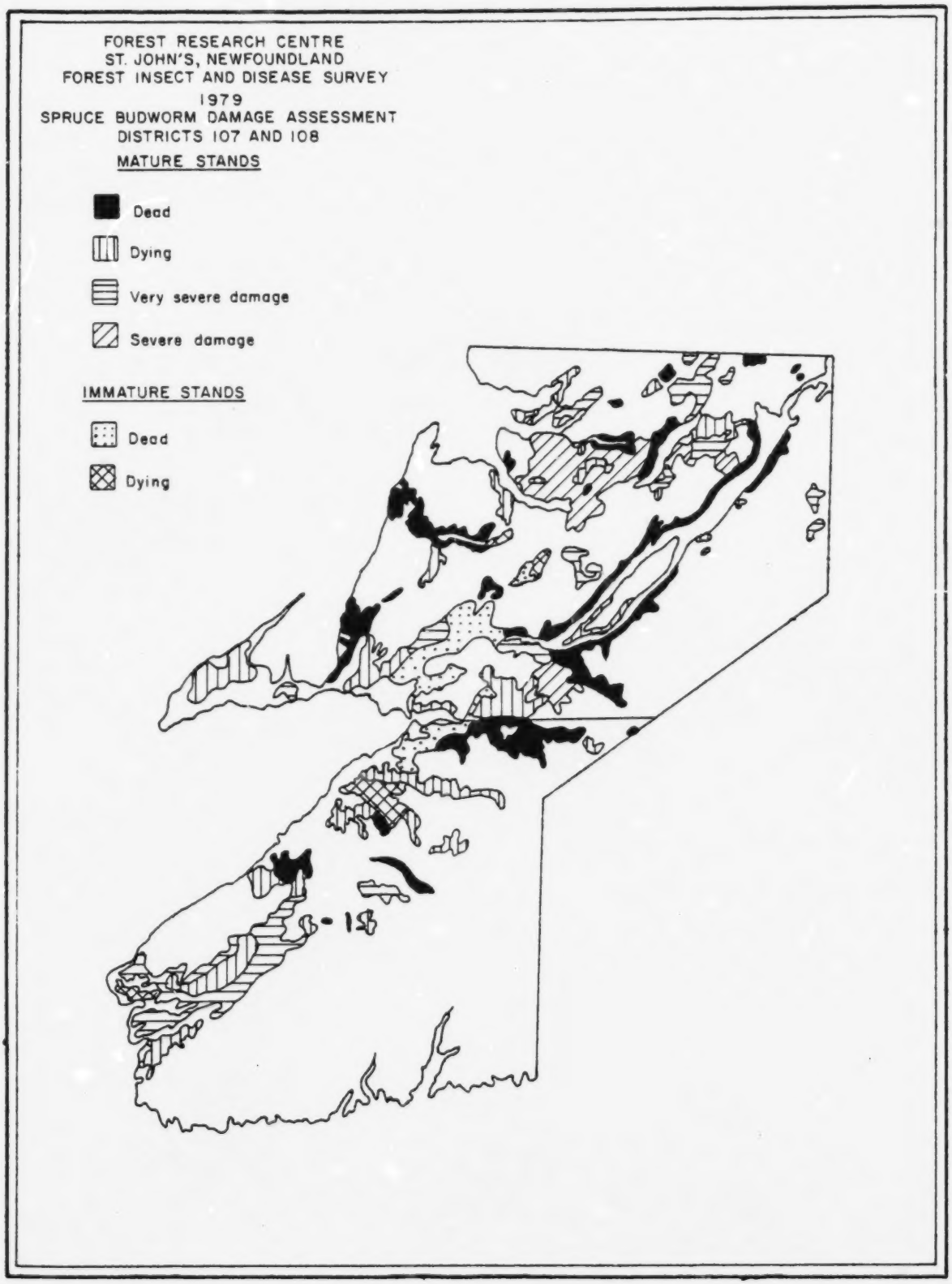
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 107 AND 108
MATURE STANDS
Dead
Dying
Very severe damage
Severe damage
IMMATURE STANDS
Dead
Dying
S-15

FIG. 6

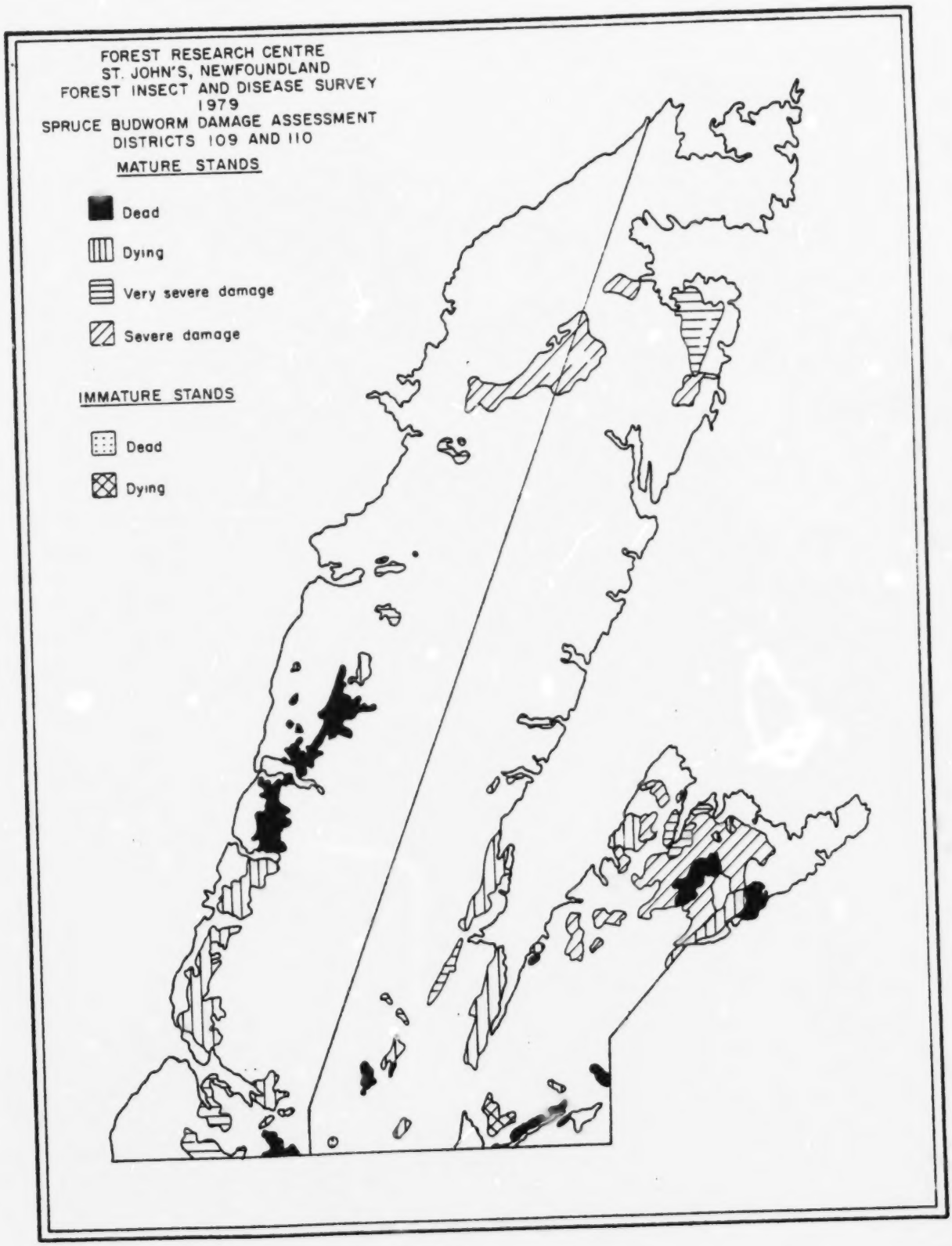
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
SPRUCE BUDWORM DAMAGE ASSESSMENT
DISTRICTS 109 AND 110
MATURE STANDS
Dead
Dying
Very severe damage
Severe damage
IMMATURE STANDS
Dead
Dying

FIG. 7

have been conducted annually since 1977 in western Newfoundland and submerchantable stands, except in the Barachois Brook and Barry Brook areas, sustained no budworm defoliation for the past two seasons and stands with one to two years of severe defoliation have fully recovered. The majority of the stands in the Barachois Brook area are dead or dying and at Barry Brook severe damage including bare tops are common. Tree mortality continued in stands under initial stress from damage caused previously by other insects and more recently by the budworm.

Natural Control Factors

Larval and pupal parasitism in 1979 was about 25%, 10% lower than last year. This was probably due to the higher larval and pupal survival than in previous years. The two most common parasites in 1979 were Glypta fumiferanae (Vier.) and Apanteles fumiferanae (Vier.). Among the pupal parasites Apechthis ontario (Cress.) and Phaeogenes hariolus (Cress.) continued to be the two most important. None of these parasites appeared to be affected by the application of Bacillus thuringiensis on spruce budworm damaged stands. Fungal infection, caused by Entomophthora spp., in 1979 was even lower than 1978. This was undoubtedly caused by the warm and dry weather during budworm development. Fungal infection was not detected until budworm populations were in the sixth instar with little effect on the overall budworm populations. Another species of fungus, possibly Cordyceps sp. was also found to attack budworm larvae. However, the incidence of this fungus was extremely low.

Forecast For 1980

The egg-mass survey was conducted in September at 917 locations on the Island and 21 in Labrador (Appendix I). This survey showed that the outbreak in 1980 will be approximately the same size as in 1979. Moderate and severe defoliation is expected to occur on about 932 300 ha distributed predominantly in central and eastern Newfoundland from Red Indian Lake and Twin Lakes to Bay d'Espoir and east to Random Island including the Bonavista and Avalon peninsulas (Table 6, Fig. 8). The overwintering larval survey was conducted in late fall to check and refine the results of the egg-mass survey. Fifty-one samples were collected on the Island (Appendix I). An additional 38 000 ha was added to the forecast for a total of 970 300 ha. In western Newfoundland only a few areas are forecast to remain in the severe defoliation category in 1980, these include the Codroy Valley, Fishell's River, Barry Brook, Deer Lake and the Burlington Road areas and near Main Brook on the Northern Peninsula. In the latter area an infestation of hemlock looper is also imminent.

No egg-mass counts were found in Labrador and no moderate and severe defoliation is forecast to occur in 1980.

Table 6. 1980 spruce budworm forecast of moderate-to-severe defoliation areas by ownership and management unit in productive forest.

Management unit no.	Ownership	Hectares	Acres
1A	Crown	11 863	29,313
1	"	24 084	59,514
2	"	169 741	419,438
3	"	860	2,124
4	"	14 224	35,149
4	Price	105 409	260,471
5	Crown	85 543	211,382
5	Bowater	55 305	136,662
5	Price	20 640	51,001
6	Bowater	87 805	216,971
6	Price	10 056	24,849
7	Crown	21 588	53,345
7	Bowater	18 642	46,066
8	Crown	81 102	200,406
8	Bowater	16 821	41,566
8	Price	2 655	6,561
9	Crown	17 499	43,240
9	Bowater	18 168	44,893
9	Price	340	841
10	Crown	1 858	4,592
10	Bowater	1 437	3,551
10	Price	31 408	77,612
11	"	28 813	71,199
12	"	29 622	73,198
14	Crown	18 444	45,576
14	Bowater	6 244	15,429
15	"	1 566	3,869
16	Crown	955	2,360
16	Bowater	2 440	6,029
18	Crown	13 579	33,555
18	Bowater	5 629	13,909
18	Price	330	816
	TNNP	26 946	66,586
	Private	729	1,801
Total		932 345	2,303,873
	Crown	461 340	1,139,994
	Bowater	214 057	528,945
	Price	229 273	566,547
	GMNP	-	-
	TNNP	26 946	66,586
	Private	729	1,801
Total		932 345	2,303,873

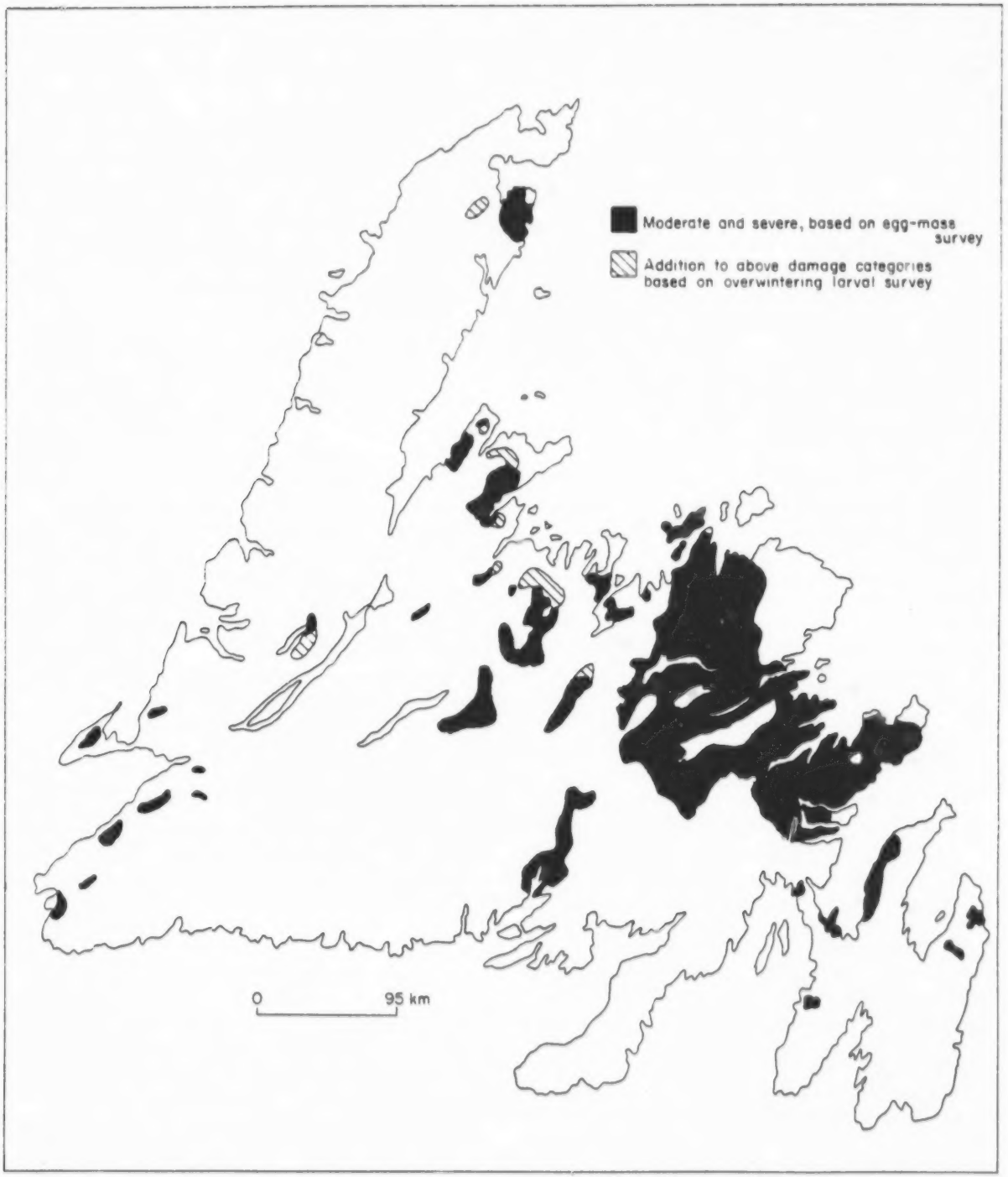
Moderate and severe, based on egg-mass survey
Addition to above damage categories based on overwintering larval survey
0
95 km

Fig. 8. Forecast moderate and severe spruce budworm defoliation for 1980.

Hazard Areas In 1980

The results of the egg-mass survey, data on the level of current and previous years defoliation and tree vigor for each egg-mass sample point were combined into a hazard rating and used for delineating budworm hazard areas. A moderate to high rating indicates that tree vigor will be reduced and some top killing will occur. A very high rating means that extensive top killing and tree mortality are likely to occur. In 1980, based on the egg-mass survey, moderate to high hazard with high population levels are expected on 901 800 ha (Table 7, Fig. 9). The overwintering larval survey added an additional 34 800 ha to this area for a total of 936 600 ha on the Island. These high hazard stands correspond to the areas forecast to have moderate and severe defoliation in 1980 and are distributed predominantly in central and eastern Newfoundland. The 517 800 ha of stands already in the dead, dying and very severely damaged classes are rated in the very high hazard category, especially areas with a forecast of high populations. The dead, dying and very severely damaged stands with high population levels totalled 187 300 ha and are also included in the areas forecast to have moderate to high hazard. The remainder of these stands are forecast to have very low population levels.

The Forestry Branch, Department of Forest Resources and Lands conducted a control program using Bacillus thuringiensis, a bacterial fungus, in the Bay d'Espoir area. Due to the late arrival of the spray agent and the advanced development of the budworm, defoliation was severe in this area and very little foliage was saved.

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) — Larval numbers of the looper continued to increase in several areas of the Island, mainly in western and central Newfoundland. The most severe defoliation was reported on the Northern Peninsula. Two severe infestations, located in mature fir stands were found near Salmon River and Main Brook. Severe defoliation of 75-100% of the total foliage, occurred in patches of several hectares each throughout an area of 550 ha of productive forest, near Salmon River and in a 330 ha area, six km west of Main Brook. Numerous looper moths were observed between both infestations suggesting that they will probably increase in size and may coalesce in 1980. High moth counts were also recorded north of Castors River, from Hare Bay to Coles Pond, particularly near Tom Rose's Pond, and in the Horsechops area near Roddickton. Low moth and larval counts occurred at North Arm, Piccadilly Head Provincial Park, Georges Lake, Island Pond, Deer Lake, Goose Arm Road, Berry Hill and McKenzie's Brook (Gros Morne National Park), Birchy Lake and Indian Pond (Fig. 10).

Looper egg samples showed an average of 4.3 eggs per 1000 cm^2 of birch bark and 3.9 eggs per 1000 cm^2 of bark in the Tom Rose's Pond and Horsechops areas respectively. However, approximately 24% of the looper eggs in the latter area were parasitized.

Table 7. 1980 spruce budworm moderate-to-high hazard areas by ownership and management unit in productive forest.

Management unit no.	Ownership	Hectares	Acres
1A	Crown	8 464	20,915
1	"	24 084	59,514
2	"	169 741	419,438
3	"	860	2,124
4	"	14 224	35,149
4	Price	105 409	260,471
5	Crown	71 018	175,490
5	Bowater	55 305	136,662
5	Price	20 639	51,001
6	Bowater	87 805	216,971
6	Price	10 056	24,849
7	Crown	21 588	53,345
7	Bowater	18 642	46,066
8	Crown	72 665	179,560
8	Bowater	15 776	38,984
8	Price	1 473	3,641
9	Crown	17 499	43,240
9	Bowater	18 168	44,893
9	Price	340	841
10	Crown	1 858	4,592
10	Bowater	1 437	3,551
10	Price	33 995	84,004
11	"	28 813	71,199
12	"	26 964	66,630
14	Crown	18 444	45,576
14	Bowater	6 244	15,429
15	"	1 566	3,869
16	"	1 565	3,868
18	Crown	13 579	33,555
18	Bowater	5 629	13,909
18	Price	330	816
	TNNP	26 946	66,586
	Private	729	1,801
Total		901 855	2,228,539
	Crown	434 024	1,072,498
	Bowater	212 137	524,202
	Price	228 019	563,452
	GMNP	-	-
	TNNP	26 946	66,586
	Private	729	1,801
Total		901 855	2,228,539

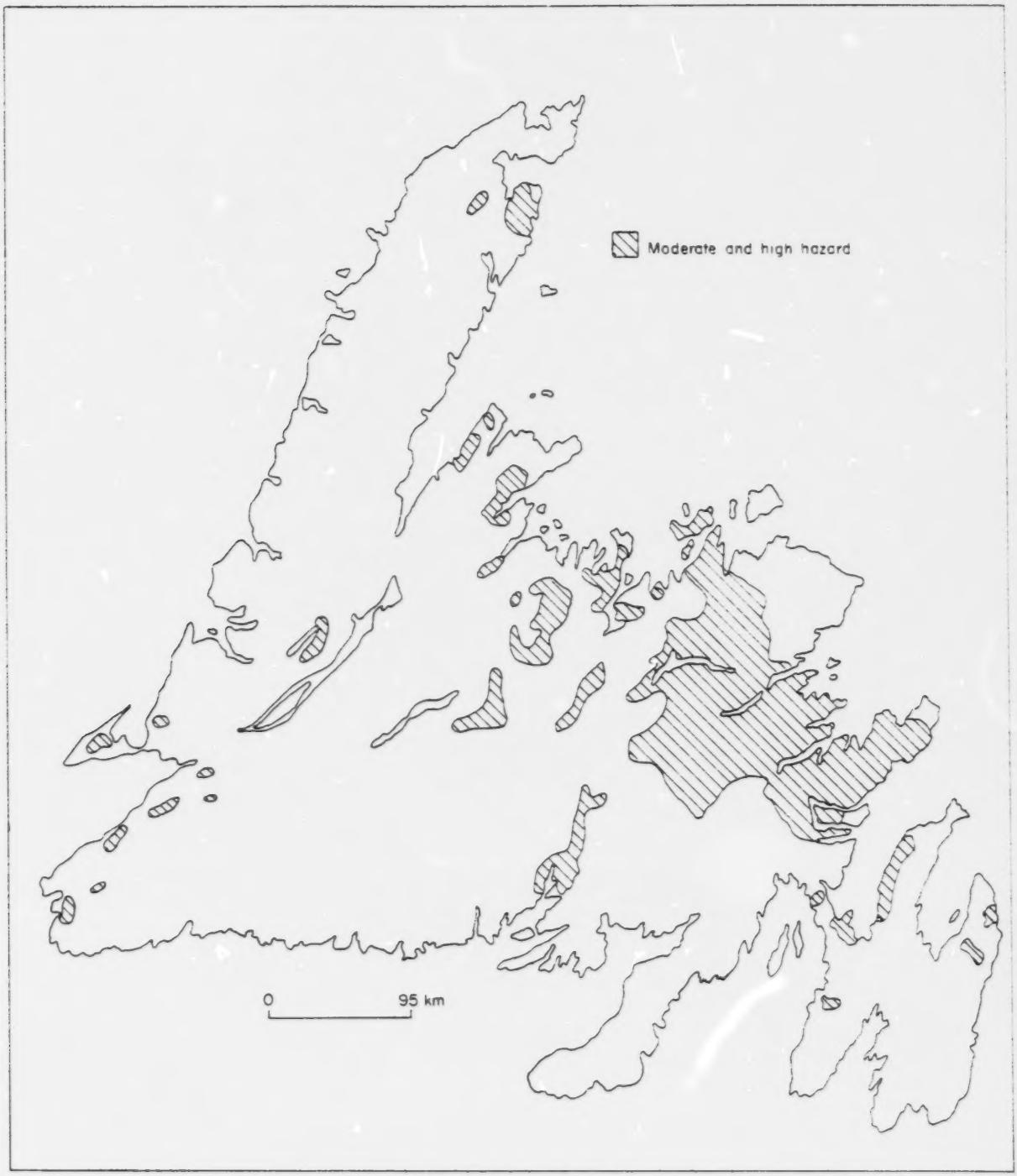

Fig. 9. Areas of moderate and high hazard with high populations for 1980.

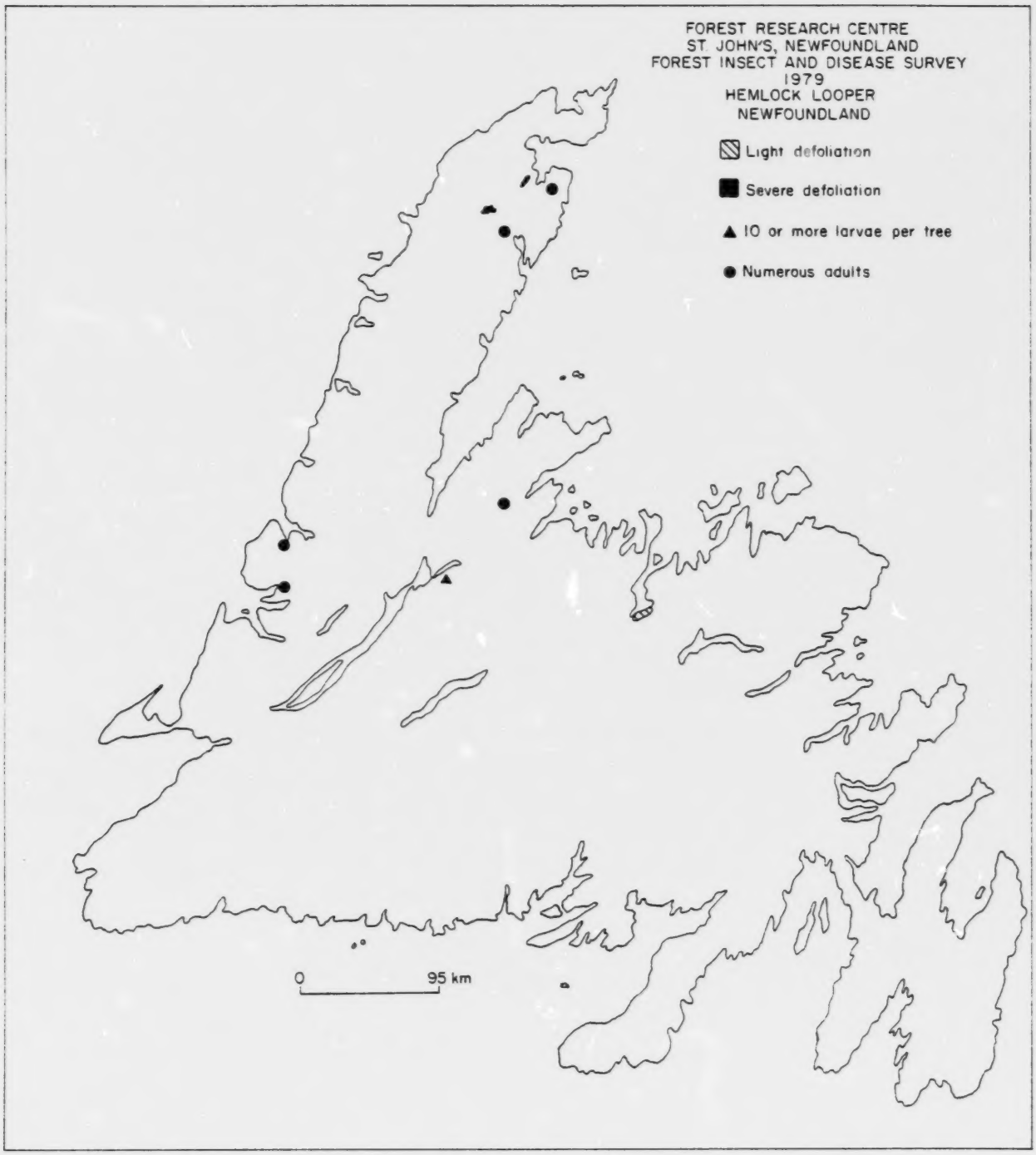
FOREST RESEARCH CENTRE
ST. JOHN'S, NEWFOUNDLAND
FOREST INSECT AND DISEASE SURVEY
1979
HEMLOCK LOOPER
NEWFOUNDLAND
Light defoliation
Severe defoliation
10 or more larvae per tree
Numerous adults
0
95 km

FIG. 10

In central Newfoundland significant larval numbers occurred along the Trans Canada Highway between Jumpers Brook and Norris Arm. Most moth sightings were also recorded in the Little Red Indian Pond and Millertown Junction areas. The average number of larvae per tree sample and number of collections for the Island are as follows:

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	90	0.1	1.5	12.0

Spruce Coneworm, Dioryctria reniculelloides M & M — The size of the coneworm infestation decreased in 1979 in the Gander to Port Blandford areas. The infestation now extends from Sops Arm to Gander. Population levels were low in the Sops Arm Provincial Park but moderate to high along the Burlington and LaScie roads and between Badger and Botwood. Coneworm populations were found in conjunction with the spruce budworm and accounted for about half the defoliation of black spruce stands between Badger and Botwood.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	96	0.1	9.3	51.0

Spruce Budmoth, Zeiraphera canadensis Mut & Free. — Moderate to high larval numbers were collected from white spruce stands at Campbells Creek on the Port au Port Peninsula and near Dildo Pond, Trinity Bay. Current defoliation was estimated at 20% near Campbells Creek and 5% at Dildo Pond.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	9	0.2	7.1	25.0

Balsam Woolly Aphid, Adelges piceae (Ratz.) — There has been a notable increase in aphid population levels throughout the area between the Codroy Valley and Stephenville in western Newfoundland. The aphid has persisted in this area since the early 1950's but decreased and remained low since 1967. The increase in population levels may be the beginning of a new outbreak. Isolated infestations identified last year in central and eastern Newfoundland have remained active. These areas were found north of Lewisporte, near Summerford on New World Island and at several locations on Random Island where moderate stem attack was also observed.

Larch Sawfly, Pristiphora erichsonii (Htg.) — An outbreak of this sawfly was recorded throughout western Newfoundland from the Codroy Valley to Ten Mile Lake on the Northern Peninsula. The last outbreak recorded in this area was in 1975-1976. Population levels were high and damage severe at Doyles, Mollychignic Brook, Blomidon Brook, York Harbour, Deer Lake, Howley, Trout River Road, Ten Mile Lake and Roddickton. Light damage was reported from O'Regan's, Mummichog Provincial Park, Stephenville, Port au Port, Barachois Pond Provincial Park, Stag Lake Provincial Park, Corner Brook, River of Ponds, Birchy Lake and along the Westport, LaScie and Burlington roads.

In Labrador the outbreak continued for the fifth consecutive year at a high intensity throughout the Goose Bay area. Scattered dead larch trees were observed in stands around Lake Melville.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979-Island	34	5.0	99.6	333.0
1979-Labrador	6	3.3	10.2	16.7

Shrew trapping in the four plots located at St. Georges, Halls Bay, Terra Nova National Park and Paddy's Pond was conducted in October. Weather conditions played an important role in this year's trapping results. At St. Georges shrew numbers were 6.45 per hectare, the same as in 1978. However, in the Halls Bay plot, 4.30 shrews per hectare were trapped, compared to 13.99 in 1978. There was also evidence of animal predation in this plot as some of the dead shrews were removed from the traps, probably by mink. In the Terra Nova National Park plot 6.48 shrews were captured as compared to 10.77 in 1978. Heavy rains and flooding of the trapping site probably caused the difference in numbers. The Paddy's Pond plot had 9.69 shrews per hectare compared to 5.39 in 1978. The dry weather during the trapping period probably accounted for the increase. Data of trapping for the last 11 years are shown in Table 8.

Table 8.- Estimated number of shrews per hectare in Newfoundland 1969-1979.

Location	Oct. 1969	Sept. 1970	Sept. 1971	Sept.* 1972	Sept.* 1973	Oct.* 1974	Oct. 1975	Oct. 1976	Oct. 1977	Oct. 1978	Oct. 1979
St. George's	-	-	-	-	-	-	-	-	-	6.45	6.45
Hall's Bay	8.28	7.04	6.08	5.39	8.60	9.69	-	-	-	13.99	4.30
Wiley Brook	-	12.26	8.82	6.45	9.69	6.45	Discontinued		-	-	-
Terra Nova	1.66	8.40	7.07	7.54	9.69	10.77	3.24	9.98	8.13	10.77	6.48
Paddy's Pond	-	0.00	1.51	3.24	9.69	4.30	2.15	9.98	7.34	5.39	9.69

*Ten day trapping period.

Larch Casebearer, Coleophora laricella (Hbn.) — Population levels of the casebearer remained high in several areas in eastern Newfoundland in 1979. Severe browning of larch foliage occurred for the third consecutive year at Sandy Pond and Saltons Brook in the Terra Nova National Park and in the Newtown area on the Avalon Peninsula. Severe damage was also recorded this year at Winterland on the Burin Peninsula, New Harbour, Trinity Bay, along the Salmonier Valley and near Bay Bulls Big Pond. Moderate browning was recorded in a few small larch stands along the Kings Point and Sheffield Lake roads. Table 9 shows the location, size, defoliation and average casebearer per branch.

European Pine Sawfly, Neodiprion sertifer (Geoff.) — High population levels of this sawfly were recorded in two plantations on the Avalon Peninsula in 1979 but defoliation was light in both areas. Ten percent defoliation was recorded on pines near Memorial University and Confederation Building and 5% near Windsor Lake.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	2	50.0	58.3	66.7

Larch Bark Beetle, Dendroctonus simplex LeConte — This beetle continued to cause mortality to larch trees in tamarack stands throughout most of central Newfoundland. The most conspicuous stands were located along the Trans Canada Highway between Halls Bay and Gander and along the Lewisporte Road. Larch stands near Doyles and Deer Lake were also attacked by this beetle.

Birch Casebearer, Coleophora fuscedinella (Zell.) — In 1979 the infestation boundary of the birch casebearer extended throughout the Avalon Peninsula. However, scattered ornamental birch trees were infested in the St. John's area as early as 1975. The outbreak now extends from Port aux Basques to St. John's including the Bonavista and Burin peninsulas. In western Newfoundland damage of birch was generally light from Port aux Basques to Corner Brook but was classified as severe throughout the Humber Valley and from Deer Lake to the Baie Verte Peninsula. On the Baie Verte and Northern peninsulas defoliation of birch was generally light. In central and eastern Newfoundland the outbreak was classified as severe for the fourth consecutive year. Collections of birch casebearer larvae in the parasite release sites at Gambo, Badger and Cormack failed to produce any of the introduced parasites.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	72	0.3	16.7	100.0

Table 9.- Larch casebearer infestation data for 1979.

Location	Area (ha)	Defoliation (percent)	Avg. no. of cases per branch sample
Jct. Sandy Pond Rd.	2	5	0.8
1.3 km E. Salton's Bk.	2	60	8.2
0.6 km W. Sandy Pond Rd.	20	30	15.7
St. John's (Arterial Rd.)	50	T	1.7
Newtown	1	40	19.2
St. John's (Kenmount Rd.)	100	25	4.8
New Harbour	1	40	7.5
3.7 km from T.C.H. (Salmonier Line)	10	100	6.1
0.8 km N. Bay Bulls Big Pond	250	25	14.8
1.6 km S. of T.C.H., Sheffield Lake Rd.	100	30	1.0

Satin Moth, Leucoma salicis (Linn.) — High population levels and severe defoliation were recorded throughout the St. John's area and in the Mount Pearl, Bay Bulls, Portugal Cove, St. Thomas and Carbonear areas. Complete defoliation of poplars and willows were common along many roads and in private gardens in these areas. In western Newfoundland severe defoliation of balsam poplars was recorded at Upper Ferry and light damage occurred on willow in the Stephenville area.

Year	No. of collections	No. of larvae per tree sample		
		Min.	Avg.	Max.
1979	6	0.3	9.3	100.0

OTHER NOTEWORTHY INSECTS

Species	Host(s)	Locality	Average per tree	No. of collections
Acleris variana (Fern.) Blackheaded budworm	bF, bS, wS	Districts 101, 106, 107, 108 109 & 110	1.2	23
Acroniata dactylina (Grt.) Fingered dagger	W	Churchill Road	0.3	1
Adoxus obscurus (Linn.) Western grape rootworm	Dogwood Fireweed	South Bk. Balley, Cook's Bk.	3.1	2
Anatis mali (Say) Eyespotted lady beetle	bF, wS	Deer Lake, Botwood Road, Indian River Prov. Park	0.6	6
Anomogyna eliminata (Guen.) Chameleon caterpillar	tL	Hinds Lake Road	0.3	1
Anoplonyx luteipes (Cress.) Marlatt's larch sawfly	tL	1.6 km W. of Baie Verte	2.0	1
Archips myricanus McD. A leafroller	Sal, Black Ash	Stephenville Crossing, Pasadena Field Station	4.8	4
Archips rosanus (Linn.) European leafroller	moM	Flat Bay Bk.Road, Ferryland, Jerseyside, Windsor Lake	10.5	5
Cenopis acerivorana Mack. A leafroller	rM	Barachois Pond Prov. Park, Mason's Bk. Road, Phillips Head, Botwood, Norris Arm, Twin Lakes, Jumpers Bk., Michael's Hr., Mason's Cove	4.2	10
Choristoneura conflictana (Wlk.) Large aspen tortrix	tA	3.2 km W. of Sir Richard Squires Park	1.0	1

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Choristoneura rosaceana (Harr.) Obliquebanded leafroller	rM, Pch	North Branch River, Camp 33 Road, Irishtown, 6.4 km E. Bay d'Espoir Road on T.C.H., Pt. Leamington Rd.	4.9	5
Chrysomela falsa Brown Willow leaf beetle	W	2.9 km & 4.2 km on Churchill Road	9.3	2
Chrysomela mainensis mainensis Bech. Alder leaf beetle	Sal	Beothuck Prov. Park, 10.2 km N. of Gander	4.2	2
Cinara sp. An aphid	bF	Cormack	22.0	1
Compsolechia niveopulvella Cham. Poplar leafroller	tA	Buchan's Road	0.5	1
Compsolechia sp. A leafroller	W, tA	Hind's Bk. Road near Howley, Sir Richard Squires Park, 3.2 km W. of Sir Richard Squires Park	34.5	4
Ctenicera resplendens aeraria Rand. A click beetle	bF	Star Lake Rd.	0.3	1
Ctenicera triundulata (Rand.) Three-spotted click beetle	bF, bS wB	1.6 km E. North Branch River, 3.2 km W. Gallants, Botwood Road, 1.6 km W. Gander, LaScie Road, Southeast Placentia, 17.7 km on Grand Lake Road (Labrador)	0.5	7

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Dendroctonus simplex Lec. Eastern larch beetle	tL	South Pond	4.0	1
Denticollis denticornis (Kby.) A click beetle	bF	Lomond River (GMNP)	0.3	1
Depressaria pastinacella (Dup.) Parsnip webworm	Wild parsnip	Flat Bay Bk. Road, Blue Gulch Pond Road	35.2	3
Epinotia similana (Hbn.) A leafroller	Sal, wB	Jct. Hampden & Sop's Arm Roads, Heart's Content, Salmonier Line, Mobile, 3.2 km S. Portugal Cove, Ferryland	3.2	6
Epinotia solandriana Linn. A leafroller	tA, wB	Bauline, District 106	5.8	2
Eriophyes sp. Leaf mites	rM, moM aMo	Bonne Bay Big Pond, Roddickton, G.M.N. Park, 3.2 km E. of Birchy Narrows, Mason's Bk. Road, St. John's	15.0	7
Eupithecia sp. Brown spruce looper	bF, bS	Pynn's Bk. Hill, North Branch River, Bottom Bk. Road, Botwood Road, 8.6 km E. Jumper's Bk., 1.6 km W. Gander, Gander Bay South	0.4	8
Fenusa dohrnii (Tischb.) European alder leafminer	Sal	Grand Lake Bk., 8.5 km W. South Branch River, Deer Lake, Shoe Cove Bk., Black Lake, Seal Cove Road, Districts 101, 104 & 112	13.7	18

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Fenusa pusilla (Lep.) Birch leafminer	wB, -B	Pynn's Bk., River Bk., Barachois Bk., Bottom Bk. Road, Codroy Pond, Howley, 4.8 km W. of Howley Jct., Flatwater Pond Prov. Park, G.M.N.Park, Pt. Leamington Rd., Norris Arm N. Jct., Districts 101, 104 & 112	22.1	32
Feralia jocosa (Guen.) Red-marked caterpillar	bF, bS, wS	Birchy Lake, 9.6 km N. Burlington Road, McIsaacs Bk., G.M.N. Park, Districts 104, 105, 106, 107 & 108, 7.5 km N. Gander, Gander Bay South, Goose River Bridge, Churchill Road	0.5	43
Gilpinia hercyniae (Htg.) European spruce sawfly	wS, bS	Goose River Bridge, Goose Bay, Churchill Road, Districts 107, 108 109 & 110	1.0	32
Griselda radicana Wlshm. Redstriped spruce shoot moth	bF, bS	Hind's Lake Rd., Cold Bk. Road, Bonne Bay Road, McIsaacs Bk., 2.4 km E. Hampden Jct., Jct. Wild Cove & Seal Cove Roads	2.2	6
Halisodota maculata (Harr.) Spotted tussock moth	Sal	Grand Lake Bk.	3.0	1
Hedia variegana (Hbn.) Green budworm	Pch, Apple	Pasadena Field Stn.	11.5	2
Hemichroa crocea (Four.) Striped alder sawfly	Sal	Pt. Leamington Road, 3.2 km S.W. Stanhope	5.2	2

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Hylobius sp. Root collar weevil	bF	Island Pond Bk. Road, Whites Road, O'Regan's, Comfort Cove Road, Mobile	0.3	5
Limenitis arthemis (Drury) White admiral	Sal	Jct. Baie Verte & LaScie Roads	1.0	1
Loxostege sticticalis (Linn.) Beet webworm	Garden crops, shrubs & grasses	Goose Bay (New record)	250.0	1
Mindarius abietinus Koch Balsam twig aphid	bF	Old Man's Pond, Pinchgut Lake Road, Lady Slipper Road, South Brook Valley, Districts 101, 109, 110 & 112	9.3	26
Monochamus scutellatus (Say) Whitespotted sawyer	bS, wS, bF yB	Pynn's Bk. Hill, Pasadena Field Stn., Grand Lake Rd., 2.3 km S.W. May Ann Lake, North Pond Road	0.5	5
Nadata gibbosa (J.E. Smith) Green oak caterpillar	wB, Pch, moM, W bF, Sal, dogwood Serviceberry	Barachois Bk., Flat Bay Bk. Road, Flatwater Pond Prov. Park, 7.5 km N. Gander, Norris Arm N. Jct., 1.6 km W. Gander, N.W. Gander River Road	1.4	8
Nematus limbatus (Cress.) Willow sawfly	W	Grand Lake Bk., Birchy Basin, Jct. Churchill Road	2.2	3
Nematus sp. A willow sawfly	W, Sal	Jct. Bottle Pond Road & T.C.H., Stag Lake Prov. Park, 17.6 km from Jct. (Main Bk. Road), South Side (Burnt Bay), Jct. Gayside & Birchy Bay Road	4.1	5

Cont'd ...

OTHER NOTEWORTHY INSECTS

Species	Host(s)	Locality	Average per tree	No. of collections
Neodiprion abietis complex Balsam fir sawfly	bF	Amys Lake	1.0	1
Nepytia canosaria (Wlk.) False hemlock looper	bF, bS, wS	Bottle Pond Road, Lomond River (GMNP), McIsaac's Bk.	0.4	4
Neurotoma inconspicua (Nort.) Plum webspinning sawfly	Pch	8 km N. Badger, 8.6 km N. Jumpers Bk., 3.2 km S.W. of Stanhope, South Twin Lake Road, Churchill Road	27.0	5
Nycteola cinerana N. & D. Poplar leaftier	W, Pch	Codroy Pond, Jct. Logging School Road & TCH., Deer Lake, O'Regan's, Gallants Road, Flatwater Pond Prov. Park, Main Bk. Road, Birchy Basin, Bonne Bay Big Pond, South Side (Burnt Bay), North Pond Road, Jonathan's Pond Prov. Park	1.7	12
Nyctobia limitaria (Wlk.) Green balsam looper	bF, bS	River Bk., Sheffield Lake, Northwest Gander River Road, Leech Bk. Road, Dawes Pond Road, Jackson's Cove Road, 3.2 km E. Gull Lake, Buchans, Millertown, Red Indian Lake	0.5	11
Nymphalis antiopa (L.) Mourningcloak butterfly	W	Grand Lake Bk.	10.1	1
Orgyia antigua (L.) Rusty tussock moth	aMo	Snook's Hr. Jct.	1.0	1
Papilio glaucus canadensis R. & J. Canadian tiger swallowtail	Ash	Deer Lake	1.0	1

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Phyllocnistis populiella Chamb. Aspen leafminer	tA	Phillips Head, Goose Bay, Otter Creek, Jct. Grand Lake & North West River Roads, Churchill Road	8.0	8
Phyllocolpa sp. A leaffolding sawfly	tA	Phillip's Head	5.0	1
Pikonema alaskensis (Roh.) Yellowheaded spruce sawfly	bS, wS	Bottle Pond Road, Pynn's Bk. Hill, Cooks Bk.	0.6	3
Pikonema dimmockii (Cress.) Greenheaded spruce sawfly	bS, wS	Southwest Bk. Road, Logging School Road, Wilding Lake Road, Windsor Lake	1.5	4
Podabrus sp. A soldier beetle	bF	1.6 km N. of Wiltondale (GMNP), Berry Hill (GMNP)	0.3	2
Pontania sp. A willow sawfly	W	New Bay Lake Road	8.5	1
Pristiphora geniculata (Htg.) Mountain ash sawfly	Mt. Ash	Seal Cove, Burlington Rd., 3.2 km E. Birchy Narrows, Lomond (GMNP), St. John's, Windsor Lake, Gander Bay Road, Districts 104, 105, 106, 107 & 108	53.5	19
Pristiphora lena Kinc. Little spruce sawfly	bS, wS	Westport Road, Jct. of Westport & Baie Verte Roads, Gander Bay Road, Churchill Road	1.2	4

Cont'd ...

OTHER NOTEWORTHY INSECTS (Continued)

Species	Host(s)	Locality	Average per tree	No. of collections
Pulicalvaria piceaella (Kft.) Spruce leaf miner	bF	8.6 km E. Jumper's Bk.	0.3	1
Rhyacionia buoliana (Schiff.) European pine shoot moth	P	Steady Brook	1.0	1
Scoliopteryx libatrix (Linn.) Willow scalloped owlet	W	Jct. Logging School Road & TCH., Logging School Road, Gallants, Main Bk. Road, Roddickton Road	1.0	5
Semiothisa sp. A looper	bF, wS, tL	Birchy Lake, Ming's Bight Jct., Hungry Hill Road, Lake Ambrose, Districts 107 & 108	0.4	19
Sicya macularia Harr. Lumpy looper	wB, W, Sal	2.4 km W. Crabbes River, Georges Lake, Main Brook, Norris Arm North Jct., 1.6 km W. Gander	0.5	5
Syneta sp. A leaf beetle	bF, wS	Main Brook, Lake St. John, St. Catherines, Hender's Road (Salmonier Line), Churchill Road	0.8	5
Syngrapha alias (Ottol.) Spruce climbing cutworm	bF	District 106	0.3	1
Syngrapha selecta (Wlk.) Verdigris autograph	bF, tL	District 106, Jct. Sandy Pond Road (TNNP.)	0.1	2
Thymelicus lineola (Ochs.) European skipper	Grasses	Pasadena Field Station	1.0	1

Cont'd ...

OTHER NOTEWORTHY INSECTS (Concluded)

Species	Host(s)	Locality	Average per tree	No. of collections
Tetropium cinnamopterum Kby A longhorned beetle	bF	Saltwater Pond	2.0	1
Trichiosoma sp. A sawfly	W	Main Bk. Road	0.3	1
Vanessa cardui (Linn.) Painted lady	Thistles	Loch Lomond	1.2	1
Zeriaphera fortunana Kft. Yellow spruce budworm	wS	Doyles, Random Island Causeway, Shoe Cove, St. Catherines, Dildo Pond, 17 km N. Little St. Lawrence	3.0	5

IMPORTANT FOREST DISEASES

Scleroderris Canker, caused by the fungus Gremmeniella abietina (Lagerb.) Morelet-[=Scleroderris lagerbergii Gremmen], was found, for the first time in Newfoundland. Four ornamental black Austrian pines at the Canada Agriculture Experimental Farm near Mount Pearl showed symptoms of this canker. Examination of neighbouring trees and areas and several pine plantations on the Island have failed to indicate the presence of the disease anywhere else.

Witches' Broom of Black Spruce — Broom rust of black spruce caused by eastern dwarf mistletoe Arceuthobium pusillum Peck, continued to increase in 1979. Damage of spruce was more widespread between Codroy Valley and Trout Brook in western Newfoundland and in the North Pond area in eastern Newfoundland.

Broom Rusts of Conifers — Broom rust of balsam fir caused by Melampsorella caryophyllacearum Schroet., and of black spruce caused by Chrysomyxa arctostaphyli Diet., occurred in isolated patches throughout the Island, and as in previous years, intensity of the disease varied from low to moderate. New areas of infection were recorded in Labrador. Low incidence of infection were observed in widely scattered patches near Happy Valley, Goose Bay and along the Churchill Falls and Northwest River roads.

Needle Rusts of Conifers — Needle rusts of balsam fir, Pucciniastrum epilobii Otth. and of black spruce, Chrysomyxa ledicola Lagerh. and C. empetri Schroet., occurred in scattered patches in eastern and western Newfoundland and in Labrador.

Needle Casts of Conifers — Needle cast of balsam fir caused by Isthmiella faullii (Darker) Darker, affected about 20% of the foliage of several trees near Gull Lake, Goose Bay and along the Churchill Falls Road in Labrador. A needle cast of Scots pine caused by Lophodermium pinastri (Schrad.) Chev. was common throughout the plantation along the north side of Windsor Lake.

Shoot and Leaf Blight of Trembling Aspen, Pollacia radiosa (Lib.) Bald and Cif. — Low incidence of this disease occurred again in plantation NF 76 at North Pond and along the Trans Canada Highway near Birchy Narrows and the Howley Junction. In Labrador light damage to trembling aspen trees was observed along Grand Lake and Churchill Falls roads and around the Goose Bay-Happy Valley area.

Stem and Branch Canker of Lombardy Poplar, Dothichiza populea Sacc. and Briard — This canker continued to cause tree and branch mortality of Lombardy poplar in many communities across the Island. New infections

were found on 100 young trees in a trailer park near St. John's. Approximately 60 of these trees were dead or dying. Several ornamental Lombardy poplar were affected at Searston in western Newfoundland.

Scab and Black Canker of Willow, Fusicladium saliciperdum (All. & Tub.) Lind. and Physalospora miyabeana Fuk. — These organisms were identified from samples collected from ornamental bay leaf willow in the town of Stephenville. The host trees were introduced from Quebec in 1965. Approximately 75% of the trees and 50-100% of the foliage was affected.

Frost Damage — Damage of balsam fir regeneration was common but low along the Pinchgut Lake and Carter's roads in western Newfoundland. A moderate disturbance to a semimature larch stand was recorded near Georges Brook on the Bonavista Peninsula.

Winter Drying — This condition was widespread on Scots pine throughout the plantation along Windsor Lake. About 20% damage was recorded throughout the stand. A mixed stand of balsam fir and white spruce was affected at Lockleven in western Newfoundland.

OTHER NOTEWORTHY DISEASES

Organism and Disease	Host(s)	Locality	Remarks
Apiosporina collinsii (Schw.) Höhn. Witches broom	Serviceberry	2.4 km S.W. Swift Current	Light incidence
Cytospora salicis (Cda.) Rabh. Stem canker	Willow	Steady Brook Cormack	Low to high incidence
Gymnosporangium cornutum Arth. ex Kern Leaf rust	Mountain-ash	Snook's Hr. Jct. Churchill Road	Low incidence
Heat injury	Alder, speckled	Mason's Bk. Road, Bottom Bk. Road	Low incidence
Kabatiella apocrypta (Ell. & Ev.) Arx Large leaf spot	Maple mountain	Gros Morne National Park, Phillips Head, Leading Tickles Rd. 2.2 km E. of Lomond Jct.	Light to high infection
Melampsora abietis-capraearum Tub. Leaf rust of willow	Willow	Spring Gulch Road, Churchill Road	Light infection
Milesia fructuosa Faull Needle rust	Fir, balsam	Plum Point	Low incidence
Mycosphaerella sp. Leaf spot	Mountain-ash	Island Pond Road, Churchill Road	Low to high incidence
Phyllosticta minima (Berk. & Curt.) Underw. & Earle Purple eye spot	Maple, mountain red	Barachois Pond Prov. Park, Southwest Bk. Road, Deer Arm (GMN Park), Mason's Bk. Road	Low to moderate incidence
Rhytisma salicinum (Pers.) Fr. Tar spot	Willow	Spring Gulch	Low incidence
Taphrina carnea Johans Leaf blister	Birch, white	5.6 km W. Trout Brook (TCH)	High incidence

TREE PEST EXTENSION SERVICE

Insects

Forest Insect and Disease Survey technicians were responsible for replying to requests from Municipal Councils and property owners throughout the Province. A total of 116 calls were received from citizens at the Forest Research Centre. As a result of these calls, approximately 93 pamphlets and 17 letters were mailed and 29 visits were made to property owners explaining an insect and/or disease problem. The Forest Research Centre also provided 'Forestry Notes' of insect and disease pests to the Newfoundland Forest Service for distribution to their rural forest fire depots. The cooperation of Canada Department of Agriculture is acknowledged for providing updated pamphlets on garden and household pests.

The major pests recorded during 1979 were:

Spruce Budworm The spruce budworm was the most serious pest of ornamental spruce and fir. Population levels were high throughout the St. John's Metropolitan area, particularly in the towns of Outer Cove and Torbay.

European Pine Sawfly Population levels continued to cause severe damage to ornamental pine trees on the Confederation Building grounds and Memorial University Campus. This sawfly was also active in a plantation near Windsor Lake. Further releases of the larval parasite Lophyroplectus luteatus (Thunb.) and the pupal parasite Pleolophus basizonus (Grau.) were made in the infested area.

Satin Moth A severe infestation occurred on the Avalon Peninsula for the third consecutive year. Complete defoliation of poplars and willows were reported throughout the St. John's, Kilbride, Holyrood and Bay Roberts areas.

Beet Webworm This webworm is a pest of agricultural crops and was found in the Province for the first time this summer. Numerous larvae were found on the lawns at the former U.S. Military Base in Goose Bay.

OTHER NOTEWORTHY INSECTS

Species	Host(s)	Locality
Archips spp. Leaf rollers	rM	St. John's
Blissus leucopterus (Say.) Chinch bug	Grasses	St. John's
Coleophora fuscedinella (Zell.) Birch casebearer	wB	Burin, Fortune, Mt. Pearl, Seal Cove, St. John's, Topsail
Cryptorhynchus lapathi (L.) Poplar and willow borer	W	Manuels
Dendroctonus simplex Lec. Eastern larch beetle	tL	Paddy's Pond
Desmocerus palliatus (Forst.) Elder borer	Golden elder	St. John's
Fenusa pusilla (Lep.) Birch leafminer	wB	Gander
Hylobius sp. Root collar weevil	Pine	Lewisporte
Ocnerostoma strobivora Free. White pine needleminer	ewP	St. John's
Rhyacionia buoliana (Schiff.) European pine shoot moth	Lodgepole pine	Steady Brook
Vasates quadripedes (Shimer) Maple bladdergall mite	rM	St. John's

DISEASES

Nectria Canker continued to be the most common disease in 1979. It was found in the St. John's area on three different host species, dwarf juniper, Norway maple and flowering crab. The incidence varied from low to high, and percent infection varied from 5 to 40.

Armillaria Root Rot was conspicuous at some locations in St. John's and Mount Pearl. The host species affected were white birch and pin cherry. The incidence varied from moderate to severe, and resulted in the death of about 13 trees at two locations.

Cytospora Canker affected willow and silver maple. Seventy-five percent of the foliage and shoots of willow trees in Deer Lake showed dieback and canker symptoms. However, 5 to 30% of the foliage was affected in St. John's. A low incidence of the disease on silver maple was also recorded in St. John's.

Dothichiza Canker caused a very severe infection on Lombardy poplar at some locations. In Torbay area, all the one hundred trees were infected and percent mortality was 60. In Mount Pearl, the disease affected ten 4 to 5 year old trees.

Scab and Black Canker of Willow were observed on laurel leaf willow in Stephenville. The incidence of these two diseases was moderate to severe, affecting 50 to 100% of the foliage.

Scleroderris Canker was observed on a few ornamental trees of black Austrian pine near Mount Pearl. One of the affected trees was severely damaged. This is the first record of the disease from Newfoundland and Labrador.

OTHER NOTEWORTHY DISEASES

Species	Host(s)	Locality	Remarks
Infectious diseases			
Coccomyces hiemalis Higgins Shot hole	Pin cherry	St. John's Mount Pearl Goose Bay	Low incidence
Cronartium ribicola Fischer Blister rust	White pine	Terra Nova National Park	All the nine trees at a location were affected; one of the trees was killed by the disease
Kabatiella apocrypta (Ell. & Ev.) Arx Large leaf spot	Red maple	St. John's	Low incidence
Taphrina cerasi (Fckl.) Sadeb. Taphrina witches'-broom	Pin cherry	St. John's Mount Pearl Goose Bay	Percent trees affected varied from 30 to 100. However, percentage of the affected foliage varied from 5 to 90
Taphrina populina Fr. Leaf blister	Lombardy poplar	Torbay area	Only found on one tree and less than 5% of foliage affected
Frost injury	Lombardy poplar	Torbay area	Only observed on one tree
Heat injury	Red maple	St. John's	Low incidence

APPENDIX I

Appendix I. Results of spruce budworm egg-mass and overwintering larval surveys.

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
EASTERN NEWFOUNDLAND						
1	Bay Bulls	3	23	Nil	L	-
3	Bay Bulls Big Pond	3	0	Nil	Nil	-
4	Goulds	3	0	Nil	Nil	-
5	Cochrane Pond	3	422	Nil	M	-
6	Blackhead	3	309	L	L	-
7	Logy Bay	3	531	M	M	-
8	Torbay	3	0	Nil	Nil	-
9	Pouch Cove	3	0	L	Nil	-
10	Bauline	3	0	Nil	Nil	-
11	Bauline	3	0	Nil	Nil	-
12	Bauline Line	3	56	L	L	-
13	St. Phillips	3	44	L	L	-
16	Paddy's Pond	1	400	M	S	-
18	6.4 km W. Paddy's Pond	3	0	Nil	Nil	-
19	Butterpot Prov. Park	3	69	L	L	-
20	6.4 km N. Holyrood	3	0	L	Nil	-
21	Hr. Main Pond	3	0	Nil	Nil	-
22	Southwest Pond	3	20	Nil	L	-
23	Jct. Prison Camp Rd.	3	0	L	Nil	-
24	6.4 km N.E. St. Catherines	3	0	Nil	Nil	-
26	New Bridge	3	0	L	Nil	-
27	St. Catherines	3	0	Nil	Nil	-
29	Long Harbour	3	0	L	Nil	-
30	Dunville	2	0	L	Nil	-
31	Placentia	2	0	L	Nil	-
32	Dildo Pond	3	66	Nil	L	-
33	Dildo Arm	3	51	L	L	-
34	Hopeall	3	23	L	L	-
39	Heart's Delight	3	223	S	L	-
40	Chapel Arm	3	0	Nil	Nil	-
42	Kite Hill	2	673	S	S	-
43	Thornlea	1	491	S	S	-
48	Jack's Pond Prov. Park	1	430	S	S	-
50	Hatchet Cove	3	562	S	M	-
51	St. Jones Within	1	444	S	S	-
52	Adeytown	3	512	L	M	-
53	Random Island	1	1333	S	S	-
54	Elliotts Cove	1	705	M	S	-
56	Weybridge	3	657	S	M	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
57	Lady Cove	1	404	M	S	-
58	Hickman's Hr. Jct.	1	389	M	S	-
59	Britannia	1	600	L	S	-
60	1.6 km E. Barton	3	765	M	S	-
61	5.6 km E. Monroe	1	369	S	S	-
64	6.4 km S.E. Bonavista Rd.	1	427	S	S	-
65	12.8 km S.E. Bonavista Rd.	2	186	S	M	-
66	Northern Pond	3	789	S	S	-
67	Portland Rd.	1	388	S	S	-
68	Bonavista Hwy.	1	495	S	S	-
69	Sweet Bay	3	1225	L	S	-
70	6.4 km E. Southern Bay	1	372	M	S	-
71	Summerville	3	377	M	M	-
72	Plate Cove	1	430	M	S	-
73	King's Cove Rd.	1	358	M	S	-
74	King's Cove	1	313	M	M	-
75	Port Rexton Rd.	1	514	M	S	-
76	Lockston Prov. Park	1	712	M	S	-
77	3.2 km N. Port Rexton	3	496	L	M	-
78	Kinght's Cove	2	178	M	M	-
79	4.8 km S. Cove Upper Amherst Cove	2	243	S	M	-
80	Catalina Rd.	2	48	L	L	-
87	Fire Lookout (TNNP)	3	1256	L	S	-
97	Jct. T.C.H. Park Headquarters	3	754	L	S	-
98	Saltons Brook (TNNP)	3	1009	M	S	-
99	Southwest Arm (TNNP)	3	235	L	L	-
100	Bluehill Pond (TNNP)	3	3659	S	S	-
127	8.0 km George's Pond	1	606	S	S	-
128	Thorburn Lake	1	345	S	S	-
129	Port Blandford	2	104	Nil	L	-
130	8.0 km W. Bunyan's Cove	1	348	S	S	-
131	Bunyan's Cove	1	350	S	S	-
132	Northwest Arm (TNNP)	3	491	M	M	-
134	Jct. Sandy Pond Rd. (TNNP)	3	293	M	L	-
135	Tidewater	3	1846	S	S	-
136	Charlottetown	3	634	L	M	-
138	3.2 km S. Dunphy's Pond Rd. (TNNP)	3	1032	L	S	-
139	Dunphy's Pond	3	199	L	L	-
140	Terra Nova Bk.	3	0	Nil	Nil	-
143	Chain Pond	3	744	S	S	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
145	Northwest Pond	2	0	Nil	Nil	-
146	Terra Nova Rd.	1	429	S	S	-
147	Terra Nova Rd.	2	143	M	L	-
148	Terra Nova Rd.	1	762	-	S	-
149	Lake St. John	2	678	S	S	-
150	4.8 km S. New Pond	2	785	S	S	-
151	Mollyguajeck Lake	2	540	S	S	-
152	Larry's Pond	2	0	L	Nil	-
153	Larry's Pond	3	239	L	L	-
154	Lake St. John	2	0	Nil	Nil	-
156	Deer Pond	3	273	S	L	-
157	Deer Pond	2	220	S	M	-
158	Newton Lake	2	146	M	L	-
159	Deer Pond area	3	531	M	M	-
160	4.8 km S. Southwest Pond	2	144	L	L	-
163	Triton Brook	2	122	L	L	-
164	Deer Pond	1	533	S	S	-
165	Triton Brook	2	131	Nil	L	-
166	Triton Brook	2	48	S	L	-
167	Riverhead Brook	2	0	L	Nil	-
168	Deadwolf Pond	2	0	M	Nil	-
169	Gambo Pond	1	400	S	S	-
172	North Pond	1	341	M	S	-
173	Mason's Pond	2	578	L	S	-
174	Gambo	2	734	S	S	-
850	Victoria	3	724	S	S	-
851	9.6 km W. Carbonear	3	0	Nil	Nil	-
852	Southern Cove Pond	2	78	L	L	-
853	Cavendish	3	718	L	S	-
854	Green's Harbour	1	429	S	S	-
856	Ocean Pond	2	1757	S	S	-
857	8.0 km W. Trinity	2	102	L	L	-
858	6.4 km N.E. Champneys	2	0	Nil	Nil	-
1001	Admirals Cove	3	55	Nil	L	-
1002	LaManche Prov. Pk.	3	134	Nil	L	-
1003	Holyrood	3	0	Nil	Nil	-
1004	Gushue's Pd. Prov. Pk.	3	0	Nil	Nil	-
1005	Roche's Line	3	0	Nil	Nil	-
1006	Dunville	3	0	L	Nil	-
1007	Fox Harbour	3	0	Nil	Nil	-
1008	Dunville	3	556	S	M	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
1009	Dunville	3	0	Nil	Nil	-
1010	Old Shop	2	0	Nil	Nil	-
1011	Norman's Cove	2	589	S	S	-
1012	4.8 km E. of New Harbour	3	60	Nil	L	-
1013	Whitbourne	3	0	L	Nil	-
1014	Hearts Delight	3	357	S	M	-
1015	Clifton Access Road	1	612	S	S	-
1016	Waterville Access Road	2	315	S	M	-
1017	Harcourt	2	1113	S	S	-
1018	Ocean Pond	3	359	S	M	-
1019	" "	3	402	S	M	-
1020	" "	2	0	L	Nil	-
1021	" "	2	0	Nil	Nil	-
1022	Trinity	3	353	M	M	-
1023	"	2	46	S	L	-
1024	Plate Cove	2	182	L	M	-
1025	Catalina	3	725	S	S	-
1026	"	3	515	S	M	-
1027	Knights Cove	2	616	S	S	-
1028	Bonavista	1	400	S	S	-
1029	Knights Cove	2	769	S	S	-
1030	Red Cliff	3	692	M	S	-
1031	Amherst Cove	1	500	M	S	-
1032	Winterbrook	2	513	S	S	-
1033	Jamestown	2	628	S	S	-
1034	Charleston	1	409	S	S	-
1035	Culls Harbour	3	407	S	M	-
1036	Alexander Bay	2	89	M	L	-
1051	Georges Lake	2	258	S	M	-
1052	Bunyan's Cove	3	278	S	L	-
1053	Mollyquajeck Lk.	2	0	Nil	Nil	-
1054	Saunders Pond	2	1183	S	S	-
1055	Glovertown	3	530	S	M	-
1056	Gambo Pond	1	580	L	S	-
1068	Deer Pond	2	0	Nil	Nil	-
1069	Larrys Pond	1	606	S	S	-
1070	Lake St. John	1	356	S	S	-
1071	Middle Ridge	2	0	L	Nil	-
Average per branch			213			

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
CENTRAL NEWFOUNDLAND						
119	Conne River	1	826	M	S	-
120	6.4 km N. Head Bay d'Espoir	1	352	M	S	-
121	Milltown	1	600	S	S	-
122	Head Bay d'Espoir	1	1222	S	S	-
123	4.8 km N. St. Veronicas	3	1401	S	S	-
124	St. Joseph's Cove	2	949	M	S	-
125	Swanger Cove	3	859	M	S	-
176	Dark Cove	1	393	-	S	-
177	Lower Dark Cove	2	81	S	L	-
178	Square Pond	2	532	S	S	-
179	6.4 km E. of Benton Jct.	1	400	S	S	-
180	Benton Jct.	1	679	S	S	-
181	Soulis Pond	1	359	S	S	-
182	Soulis Pond	3	182	L	L	-
183	Soulis Pond	2	1034	S	S	-
184	Home Pond	1	400	S	S	-
186	Rodney Pond	2	67	L	L	-
188	Joe Batt's Pond	3	687	S	S	-
189	Glenwood	2	84	L	L	-
190	Gander Lake	1	304	M	S	-
191	Gander Lake	1	500	M	S	-
200	Hunt's Brook	3	250	S	L	-
201	S.W. Gander River	2	0	L	Nil	-
202	Dead Wolf Brook	1	660	L	S	-
203	Watcher's Brook	1	600	M	S	-
205	S.W. Gander River	3	940	L	S	-
208	N.W. Gander River	3	185	L	L	-
209	N.W. Gander River	2	0	M	Nil	-
210	S.W. Gander River	2	0	L	Nil	-
211	Great Gull River	2	0	L	Nil	-
212	Third Berry Hill Pond	2	827	S	S	-
213	N.W. Gander River	2	0	L	Nil	-
214	N.W. Gander River	2	0	L	Nil	-
215	5.0 km N. Rattling Pond	2	0	Nil	Nil	-
219	8.0 km N. Crowe Lake	2	0	L	Nil	-
221	Burnt Lake	2	1425	S	S	-
223	Tote Hill	3	723	M	S	-
224	Bay d'Espoir Rd.	1	340	S	S	-
225	Miquel's Lake	2	0	S	Nil	-
226	Bay d'Espoir Rd.	2	0	L	Nil	-

Cont'd ...

Appendix 1. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
227	Bay d'Espoir Rd.	2	0	M	Nil	-
228	Bay d'Espoir Rd.	1	417	M	S	-
229	Little Gull Lake	3	46	M	L	-
230	Bay d'Espoir Rd.	1	40	S	S	-
231	Bay d'Espoir Rd.	2	0	L	Nil	-
232	Bay d'Espoir Rd.	2	121	L	L	-
233	Twillick Brook	2	735	S	S	-
234	Great Rattling Brook	2	0	L	Nil	-
235	North Great Rattling Brook	2	0	Nil	Nil	-
236	North Great Rattling Brook	2	0	L	Nil	-
237	Great Rattling Brook	2	545	S	S	-
238	Miquels Lake	2	72	M	L	-
239	Great Rattling Brook	3	342	S	M	-
240	Diversion Lake	2	0	M	Nil	-
241	Sandy Brook	2	89	Nil	L	-
242	Diversion Lake	2	0	L	Nil	-
244	Lemott's Lake	2	117	M	L	-
245	West Lake	2	0	M	Nil	-
246	Tom Joe Brook	2	145	L	L	-
247	10 km W. Grand Falls	2	106	-	L	-
248	Aspen Brook	1	356	S	S	-
249	Jonathan's Pond Prov. Park	2	97	S	L	-
250	Island Pond Brook	3	378	S	M	-
251	Weirs Brook	2	664	S	S	-
253	Gander Bay Rd.	2	0	M	Nil	-
254	Weirs Pond	1	345	L	S	-
255	Gander Bay	3	1000	S	S	-
256	Beaver Hill	3	283	L	L	-
257	Carmanville	2	50	L	L	-
258	Ragged Hr. River	2	0	Nil	Nil	-
259	Dog Bay	3	1016	S	S	-
260	Boyd's Cove	3	1204	S	S	-
261	Chapel Island	1	667	S	S	-
262	Summerford	1	575	S	S	-
263	Chanceport	2	602	M	S	-
264	8.0 km N. Birchy Bay	3	304	S	L	-
265	Birchy Bay	2	425	S	M	-
266	Duder Lake	2	119	L	L	-
267	Burnt Lake	1	370	S	S	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
268	Burnt Lake	2	0	L	Nil	-
269	Bellman's Pond	3	626	S	M	
270	Ten Mile Lake	2	0	L	Nil	-
271	Long Pond	3	462	Nil	M	-
272	South Pond	1	364	S	S	-
273	4 km S. Brinks Pond	2	0	L	Nil	-
274	Dans Pond	1	458	S	S	-
275	Salmon Pond	3	724	S	S	-
276	Salmon Pond	3	283	M	L	-
277	Indian Pond	2	133	M	L	-
278	4.8 km N. Southside	2	213	S	M	-
279	Campbellton	2	0	S	Nil	-
280	Newstead Rd.	2	104	L	L	-
281	Burnt Lake	2	62	S	L	-
283	Jumpers Brook	2	144	S	L	-
284	Norris Arm	3	233	Nil	L	-
285	Norris Arm N. Jct.	2	100	Nil	L	-
286	12.8 km S. Lewisporte	3	546	S	M	-
287	8.0 km S. Lewisporte	2	0	L	Nil	-
288	Norris Arm North	2	67	S	L	-
289	Brown's Arm	2	0	S	Nil	-
290	Laurenceton	2	691	S	S	-
291	Point of Bay	3	217	S	L	-
292	Indian Cove	3	381	S	M	-
293	9.6 km S. Cottrell's Cove	3	289	S	L	-
295	4.8 km N. Northern Arm	1	85	S	L	-
296	Mill Pond	2	60	-	L	-
297	West Arm Brook	2	98	S	L	-
298	Mill Cove	2	582	S	S	-
300	New Bay Pond	2	95	S	L	-
302	New Bay Pond	2	0	L	Nil	-
303	New Bay Pond	2	48	-	L	-
304	New Bay Pond	2	27	-	L	-
306	9.6 km S. New Bay Pond	3	316	S	M	-
307	Hodges Hill	2	192	L	M	-
308	Mary Ann Lake	2	0	M	Nil	H
309	Moose Pond	2	85	S	L	M
312	Mary Ann Lake	3	569	S	M	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
314	Frozen Ocean Lake	2	67	S	L	-
315	South Twin Lake	3	720	M	S	-
316	Frozen Ocean Lake	2	889	S	S	-
317	South Twin Lake	3	322	S	M	-
318	South Twin Lake	2	107	M	L	-
319	Seal Bay Brook	2	0	S	Nil	H
320	4.8 km S. Wild Bight	2	0	L	Nil	-
322	4.8 km S.W. Wild Bight	2	0	L	Nil	E
323	Mark's Lake	1	345	S	S	-
324	North Twin Lake	2	67	M	L	-
325	North Twin Lake	1	413	Nil	S	-
328	North Twin Lake	2	0	M	Nil	M
329	North Twin Lake	3	517	L	M	-
330	Sop's Lake	2	0	S	Nil	M
331	Kippen's Pond	2	0	L	Nil	-
332	Roberts Arm Rd.	2	0	L	Nil	-
333	Crescent Lake	3	238	M	L	-
340	6.4 km S. Badger	3	240	S	L	-
342	Millertown Jct. Rd.	2	198	S	M	-
343	Millertown Jct. Rd.	2	1069	S	S	-
345	Little Red Indian Pond	2	0	L	Nil	-
346	Buchans Rd.	3	0	S	Nil	-
347	Buchans Rd.	3	121	M	L	-
348	Badger Lookout	1	423	S	S	-
349	Pamehac Brook	2	0	L	Nil	-
350	6.4 km W. West Lake	2	0	M	Nil	-
351	West Lake	2	133	M	L	-
352	West Brook	2	0	L	Nil	-
353	Sandy Lake	2	0	M	Nil	-
354	Sandy Lake	2	151	S	L	-
355	Sandy Lake	2	38	L	L	-
356	Caledonia Bk. area	2	0	L	Nil	-
357	Tom Joe's Bk.	2	0	Nil	Nil	-
358	Noel Paul's Bk.	3	642	S	M	-
359	Noel Paul's Bk.	2	0	Nil	Nil	-
360	Noel Paul's Bk.	1	350	S	S	-
361	Noel Paul's Bk.	2	0	L	Nil	-
362	Noel Paul's Bk.	2	92	Nil	L	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
365	Noel Paul's Bk. area	3	377	Nil	M	-
366	Noel Paul's Bk.	2	54	Nil	L	-
367	Noel Paul's Bk.	2	0	L	Nil	-
368	Tally Pond	2	82	Nil	L	-
369	Tally Pond	1	436	S	S	-
370	9.6 km N.E. Tally Pond	2	0	L	Nil	-
371	9.6 km N.E. Tally Pond	2	178	Nil	M	-
373	11.2 km N. Tally Pond	2	0	Nil	Nil	-
374	Harpoon Bk.	2	0	Nil	Nil	-
375	Buchans Jct.	3	0	Nil	Nil	-
377	Exploits Dam	2	125	L	L	-
378	Hungry Hill	2	0	Nil	Nil	-
379	Harpoon Bk. area	1	402	-	S	-
380	Harpoon Bk.	2	0	Nil	Nil	-
381	Harpoon Hill	2	0	-	Nil	-
383	Lake Douglas	2	31	-	L	-
384	Lake Douglas	2	0	Nil	Nil	-
385	Lake Douglas	2	0	-	Nil	-
386	Wilding Lake	2	18	Nil	L	-
388	Victoria River	2	0	Nil	Nil	-
393	Victoria River	2	0	Nil	Nil	-
394	Bobby's Pond	2	0	Nil	Nil	-
395	Red Indian Lake	3	0	L	Nil	-
396	Red Indian Lake	3	0	Nil	Nil	-
397	Red Indian Lake	2	0	L	Nil	-
398	Red Indian Lake	2	0	-	Nil	-
399	Red Indian Lake	3	0	Nil	Nil	-
400	Red Indian Lake	3	0	Nil	Nil	-
401	Red Indian Lake	3	0	Nil	Nil	-
402	Victoria River	2	0	Nil	Nil	-
403	Costigan Lake	2	0	Nil	Nil	-
406	Red Indian Lake	3	0	L	Nil	-
407	Shanadithit Bk.	3	0	Nil	Nil	-
411	Lloyd's River area	2	0	Nil	Nil	-
413	Lloyd's Lake area	2	0	Nil	Nil	-
415	Lloyd's Lake	2	0	Nil	Nil	-
416	Lloyd's Lake area	2	0	Nil	Nil	-
417	Portage Lake	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
419	Battle Pond	2	0	Nil	Nil	-
452	Buchan's Rd.	1	514	-	S	-
453	Buchan's Rd.	3	0	L	Nil	-
454	Badger Bk.	3	578	S	M	-
455	Joe's Lake	2	0	M	Nil	-
457	Crooked Bog	2	75	M	L	-
460	South Bk. (Halls Bay)	2	0	Nil	Nil	-
461	Little Glodes Pond	2	0	Nil	Nil	-
462	Three Corner Pond	2	0	Nil	Nil	-
465	Burnt Pond	2	0	M	Nil	-
466	Great Gull Lake	3	50	M	L	-
467	South Bk. (Halls Bay)	2	0	L	Nil	-
468	Rocky Pond	1	373	M	S	-
469	South Pond	2	0	M	Nil	-
470	Barney's Bk.	2	0	L	Nil	-
471	Barney's Bk.	2	0	M	Nil	-
472	West Bk.	2	0	L	Nil	-
473	West Bk.	2	0	Nil	Nil	M
474	Burnt Berry Bk.	2	0	Nil	Nil	-
475	Burnt Berry Bk.	2	0	Nil	Nil	-
476	West Pond	2	1522	M	S	-
481	Springdale	2	0	M	Nil	-
482	Jct. King's Point Rd.	2	0	Nil	Nil	-
483	Davis Pond	2	0	L	Nil	E
484	King's Point Rd.	2	87	M	L	-
485	11.2 km E. Baie Verte Jct.	2	0	Nil	Nil	-
486	Indian River area	2	0	Nil	Nil	L
487	Gull Pond	2	0	Nil	Nil	L
488	King's Point	2	0	L	Nil	-
489	Jackson's Cove Rd.	3	584	S	M	-
490	Jackson's Cove Rd.	2	0	S	Nil	-
859	6.4 km S.W. Glenwood	2	0	Nil	Nil	-
860	Rodney Pond	2	730	S	S	-
861	Southwest Gander River	1	347	L	S	-
862	North Great Rattling Bk.	2	0	Nil	Nil	-
865	Leech Bk.	3	327	S	M	-
866	Indian Bay Pond	3	913	S	S	-
867	Jonathan's Pond	2	0	Nil	Nil	-
868	Barry's Pond	2	0	Nil	Nil	-
869	Hodges Hill	2	53	Nil	L	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
870	Middleton Lake	2	0	L	Nil	M
871	Sop's Arm Bk.	2	0	L	Nil	M
874	Little Red Indian Pond	2	543	S	S	-
878	Lake Bond	2	0	L	Nil	L
880	Nutmeg Hill	2	0	M	Nil	-
881	Rocky Pond	2	0	L	Nil	-
883	West Brook	2	0	Nil	Nil	-
1038	Bay d'Espoir	2	0	L	Nil	-
1039	Conne River	2	865	S	S	-
1040	Bay d'Espoir area	2	0	L	Nil	-
1041	Conne River	3	672	M	S	-
1042	9.6 km N.E. Head Bay d'Espoir	1	558	S	S	-
1043	4.8 km N.E. St. Veronica's	2	60	L	L	-
1044	6.4 km N. St. Veronica's	2	0	Nil	Nil	-
1045	3.2 km S.W. St. Josephs Cove	1	389	S	S	-
1046	Morrisville	3	540	S	S	-
1047	3.2 km E. Milltown	3	419	S	M	-
1048	6.4 km E. Milltown	3	679	S	S	-
1049	4.8 km E. Conne River	1	556	L	S	-
1050	Little River	2	137	M	L	-
1057	Hare Bay	3	484	S	M	-
1058	Hare Bay	2	0	Nil	Nil	-
1059	Middle Brook	2	400	S	M	-
1060	Gull Pond	2	136	L	L	-
1061	Gander Lake	2	0	Nil	Nil	-
1062	Gander	1	366	-	S	-
1063	Gander Lake	2	382	L	M	-
1064	Gander Lake	3	413	L	M	-
1065	Hunt's Pond	3	405	L	M	-
1066	Hunt's Pond	2	1386	Nil	S	-
1067	Hunt's Pond	2	732	S	S	-
1072	Eastern Pond	3	462	M	M	-
1073	S.W. Gander River	1	435	S	S	-
1074	S. of Webber Pond	2	0	L	Nil	-
1075	Clark's Brook	3	339	S	M	-
1076	Gander Lake	2	655	S	S	-
1077	Glenwood	2	0	Nil	Nil	-
1078	Lewis Pond	2	106	M	L	-
1079	Jumpers Brook	2	0	L	Nil	-
1081	Great Rattling Brook	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
1082	Third Burnt Hill Pond	3	205	S	L	-
1083	6.4 km N.W. Conne Pond	1	549	S	S	-
1084	Twillick Pond	2	70	S	L	-
1085	4.8 km S. Eastern Steady	3	361	M	M	-
1086	Conne River	3	413	S	M	-
1087	Home Pond	3	632	M	M	-
1088	Clarke's Head	3	763	S	S	-
1089	Clarke's Head	3	414	S	M	-
1090	Gander Lake	2	0	L	Nil	-
1091	Glenwood	2	0	Nil	Nil	-
1092	Templeman's Lake	2	47	L	L	-
1093	Rattling Pond	2	0	L	Nil	-
1094	Point of Bay	2	577	Nil	S	-
1094A	9.6 km N. Norris Arm	2	0	Nil	Nil	-
1095	9.6 km N. Point of Bay	3	168	S	L	-
1096	New Bay Road	2	0	L	Nil	-
1097	Hodges Hill	2	665	Nil	S	-
1098	Twin Lakes	2	0	S	Nil	H
1099	Twin Lakes	2	0	L	Nil	L
1100	Kippens Pond	2	39	Nil	L	-
1101	Crescent Lake	2	0	M	Nil	-
1102	Shoal Cove	2	0	L	Nil	-
1103	Noel Paul area	3	328	S	S	-
1104	W. of Noel Paul Brook	2	0	L	Nil	-
1105	Tom Joe Brook	2	0	L	Nil	-
1106	E. of Harpoon Hill	2	38	Nil	L	-
1107	Rogerson's Lake	2	0	L	Nil	-
1108	W. of Wilding Lake	2	0	Nil	Nil	-
1109	Tulk's Brook	2	0	Nil	Nil	-
1110	Lloyd's Lake	2	20	Nil	L	-
1111	Lloyd's River	2	0	Nil	Nil	-
1124	Crooked Lake	2	0	L	Nil	-
1125	Badger	2	0	Nil	Nil	-
1127	Rocky Brook	2	0	L	Nil	-
1128	Powderhorn Lake	2	0	L	Nil	-
1129	Paul's Lake	3	354	S	M	-
1130	Crooked Lake	2	124	S	L	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
1131	Rocky Pond	2	124	L	L	-
1132	Little Joe Glodes Pond	2	0	L	L	-
1133	Misery Hill	2	0	Nil	Nil	-
1134	S. of Three Corner Pond	2	0	Nil	Nil	-
1136	8 km S. South Pond	2	0	L	Nil	-
1137	9.6 km S.E. Gull Pond	2	0	Nil	Nil	L
1138	Davis Pond	2	0	Nil	Nil	-
1139	Gull Pond	2	0	Nil	Nil	-
1140	King's Point	1	350	L	S	-
1141	Middle Arm Ridge	2	40	L	L	-
1142	Burlington	3	505	L	M	-
1143	Burlington	3	167	L	S	-
1154	6.4 km S.W. Gull Pond	2	0	Nil	Nil	-
1155	Indian Pond	2	0	L	Nil	-
1156	Jct. Baie Verte Rd. & TCH.	2	256	L	M	-
1157	Burnt Berry Brook	2	0	Nil	Nil	-
1158	Sheffield Lake	2	0	Nil	Nil	-
Average per branch			121			
WESTERN NEWFOUNDLAND						
335	Jct. Woodstock Rd.	2	0	L	Nil	-
336	LaScie Rd.	2	0	Nil	Nil	-
337	Jct. Nipper's Hr. Rd.	2	74	L	L	-
418	Puddle Pond	2	0	Nil	Nil	-
421	3.2 km W. Silver Pond	2	0	Nil	Nil	-
423	Little Barachois Bk. area	2	0	Nil	Nil	-
424	Southwest Bk.	3	298	Nil	L	-
425	Southwest Bk.	2	0	Nil	Nil	-
426	Little Grand Lake	2	0	Nil	Nil	-
427	Little Grand Lake area	2	0	Nil	Nil	-
428	Little Grand Lake	2	0	Nil	Nil	-
430	Glover Island	2	0	Nil	Nil	-
431	Glover Island	2	0	Nil	Nil	-
432	W. side of Grand Lake	2	0	Nil	Nil	-
433	Corner Brook Lake	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
434	Corner Brook Lake	2	0	Nil	Nil	-
435	Corner Brook Lake	2	0	Nil	Nil	-
436	8.0 km S. Pinchgut Lake	2	0	Nil	Nil	-
437	Pinchgut Lake	2	0	Nil	Nil	-
438	Pinchgut Lake	3	0	Nil	Nil	-
439	Stag Lake	1	0	L	Nil	-
441	Lady Slipper Rd.	3	0	Nil	Nil	-
442	Lady Slipper Rd.	3	0	L	Nil	-
442A	Lower Humber	-	-	-	-	L
442B	Corner Brook Lake Rd.	-	-	-	-	L
445	Northern Hr. Rd.	2	0	L	Nil	-
446	South Bk. Valley Rd.	2	51	L	L	-
447	Island Pond	2	19	Nil	L	L
447A	Island Pond	2	0	Nil	Nil	-
448	Grand Lake	2	19	L	L	L
449	South Bk. Valley Rd.	2	0	L	Nil	-
450	Irishtown	2	0	M	Nil	-
451	Summerside	2	0	Nil	Nil	-
479A	9.6 km N.E. Gull Pond	2	0	Nil	Nil	-
493	Cross Country Pond	3	666	S	M	-
494	Burlington Rd.	2	183	L	M	-
495	8.0 km N.W. Burlington	3	810	L	S	-
496	Burlington Rd.	1	337	M	S	-
497	South Bk. (Baie Verte Pen.)	1	385	S	S	-
498	South West Bk. (Baie Verte)	2	0	L	Nil	L
501	Jct. Ming's Bight	2	130	Nil	L	-
502	Ming's Bight Rd.	2	46	Nil	L	L
503	4.8 km E. Baie Verte	2	67	Nil	L	-
504	LaScie Rd.	2	0	Nil	Nil	-
505	Baie Verte Rd.	3	299	L	L	-
506	Jct. Seal Cove Rd.	2	0	Nil	Nil	-
507	6.4 km N. Baie Verte	2	0	Nil	Nil	-
508	6.4 km N.W. Baie Verte	2	0	Nil	Nil	L
509	Wild Cove Rd.	2	111	S	L	-
510	Jct. Wild Cove Rd.	2	0	Nil	Nil	-
511	Seal Cove	3	597	M	M	-
512	Southern Pond	3	0	Nil	M	L
513	Baie Verte Rd.	2	226	L	L	-
514	Gull Pond	2	0	Nil	Nil	-
515	East Pond	2	0	L	Nil	-
516	Westport	3	0	Nil	Nil	L

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
517	Pumbly Cove	3	295	Nil	L	-
518	Wild Cove Pond	3	0	Nil	Nil	-
519	4.8 km S.W. Gull Pond	3	0	Nil	Nil	L
522	Wild Cove Pond	2	0	Nil	Nil	-
525	Black Lake	2	0	Nil	Nil	-
527	Baie Verte Prov. Park	2	0	Nil	Nil	-
528	4.8 km W. Baie Verte Jct.	2	0	Nil	Nil	-
532	Birchy Lake	2	0	L	Nil	-
533	Birchy Lake	2	0	L	Nil	-
534	Birchy Lake	2	0	L	Nil	-
535	Chain Lakes	2	103	Nil	L	-
536	Chain Lakes	2	0	Nil	Nil	-
538	Goose Brook	2	0	Nil	Nil	-
539	Hind's Bk.	2	0	Nil	Nil	-
540	Howley	2	75	Nil	L	-
541	Jct. Howley Rd. & T.C.H.	2	0	Nil	Nil	-
542	6.4 km E. of Howley	2	32	Nil	L	-
543	Sandy Lake	2	0	Nil	Nil	-
544	6.4 km E. Big Falls	2	0	Nil	Nil	-
545	Big Falls	2	0	L	Nil	-
547	Mary Ann Bk.	2	0	Nil	Nil	-
548	Crooked Feeder	3	0	Nil	Nil	-
549	Crooked Feeder	2	0	L	Nil	-
550	Junction Bk.	2	0	L	Nil	-
552	Cormack	2	0	Nil	Nil	-
553	1.6 km E. White River Rd.	2	0	Nil	Nil	-
554	Little Falls	2	0	Nil	Nil	-
555	6.4 km E. Adies Lake	3	0	Nil	Nil	-
556	Hampden Rd.	2	0	Nil	Nil	-
557	Hampden Rd.	3	50	Nil	L	-
558	Hampden Rd.	3	0	Nil	Nil	-
559	Hampden Rd.	2	0	Nil	Nil	-
560	Hampden Rd.	2	0	Nil	Nil	-
561	Sop's Arm Rd.	2	42	L	L	-
562	Sop's Arm Rd.	2	0	L	Nil	-
564	Sop's Arm Rd.	2	0	L	L	-
565	Birchy Basin	2	0	Nil	Nil	-
566	Birchy Basin	2	0	L	Nil	-
567	Taylors Bk.	2	0	Nil	Nil	-
571	8.0 km S. Sop's Arm	2	0	Nil	Nil	-
572	Sop's Arm Rd.	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
573	Sop's Arm Rd.	2	0	Nil	Nil	-
574	Main River area	2	0	Nil	Nil	-
575	Main River	2	0	Nil	Nil	-
576	Sop's Arm	2	0	Nil	Nil	-
578	Jackson's Arm	2	0	Nil	Nil	-
580	9.6 km N.W. Sop's Arm	2	0	Nil	Nil	-
581	Main River	2	0	Nil	Nil	-
582	Main River	2	0	Nil	Nil	-
583	St. Paul's Big Pond	2	0	Nil	Nil	-
585	Upper Humber area	2	0	Nil	Nil	-
586	Upper Humber	2	0	Nil	Nil	-
587	Upper Humber	2	32	Nil	L	-
588	Upper Humber	3	0	Nil	Nil	-
589	Adies River	3	0	Nil	Nil	-
590	Adies Lake	3	0	Nil	Nil	-
591	Whites River	3	125	Nil	L	-
592	6.4 km W. Adies Lake	3	0	Nil	Nil	-
593	Bonne Bay Big Pond	2	0	L	Nil	-
594	Rocky Bk.	2	0	Nil	Nil	-
595	9.6 km N.W. Deer Lake	2	0	Nil	Nil	-
596	Goose Arm Rd.	2	0	Nil	Nil	-
597	Goose Arm Rd.	2	0	L	Nil	-
599	Deer Lake	2	604	S	S	-
599A	Deer Lake	-	-	-	-	L
600	Little Harbour	2	39	L	L	L
601	Humber Canal	3	0	Nil	Nil	-
601A	Glide Lake	-	-	-	-	L
602	4.8 km N.W. Glide Lake	3	0	Nil	Nil	L
603	Grand Lake	2	0	Nil	Nil	-
605	Pynn's Bk. (9.6 km west)	2	0	Nil	Nil	L
606	Pynn's Bk.	3	273	M	L	M
607	Pynn's Bk.	2	60	M	L	M
609	Blue Gulch Pond	3	0	S	Nil	M
610	15.4 km S. Frenchman's Pond	3	0	Nil	Nil	L
611	Frenchman's Pond	3	0	Nil	Nil	-
612	Old Man's Pond	3	0	Nil	Nil	L
613	Hughes Lake	3	0	Nil	Nil	-
614	Old Man's Pond	3	0	Nil	Nil	L
615	Deer Lake	3	0	Nil	Nil	-
616	Otter Bk.	3	0	Nil	Nil	-
618	Goose Arm	2	0	L	Nil	L

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoliation	Egg-mass category*	Overwintering larvae category
619	8.0 km N. Old Man's Pond	3	0	Nil	Nil	-
620	6.4 km S. North Lake	2	0	Nil	Nil	-
622	Goose Arm Rd.	2	0	Nil	Nil	-
623	Goose Arm Rd.	2	0	Nil	Nil	-
624	Goose Arm Rd.	2	0	L	Nil	-
626	Trout River	3	0	Nil	Nil	-
627	Trout River Pond	2	0	Nil	Nil	-
628	Governor's Pond	3	0	Nil	Nil	-
629	Bonne Bay Big Pond	3	0	Nil	Nil	-
630	Bonne Bay Little Pond	2	0	Nil	Nil	-
631	East Lomond River (GMNP)	2	0	Nil	Nil	-
632	Bonne Bay Little Pond	2	0	L	Nil	-
633	Southeast Hill (GMNP)	2	0	Nil	L	-
634	6.4 km E. Glenburnie (GMNP)	2	0	L	Nil	-
635	Glenburnie (GMNP)	2	0	L	Nil	-
637	East Arm (GMNP)	2	0	L	Nil	-
638	Deer Arm (GMNP)	2	29	L	L	-
639	Deer Arm (GMNP)	2	0	L	Nil	-
641	Lobster Cove (GMNP)	2	0	M	Nil	-
642	Bakers Bk. Pond (GMNP)	2	0	Nil	Nil	-
643	6.4 km E. Green Pt. (GMNP)	2	0	Nil	Nil	-
645	St. Paul's Inlet	2	0	Nil	Nil	-
646	St. Paul's Inlet	2	0	Nil	Nil	-
647	Cow Head	2	0	L	Nil	-
649	6.4 km E. Cow Head	2	35	Nil	L	-
650	9.6 km E. Belldown's Point	2	0	Nil	Nil	-
651	9.6 km N. Baie Verte	2	0	Nil	Nil	-
652	12.8 km N. Baie Verte	2	52	Nil	L	-
653	4.0 km S. Fleur de Lys	2	0	Nil	Nil	-
654	N. of Baie Verte	3	486	S	M	-
655	3.2 km S.W. Little Lobster Hr.	2	0	Nil	Nil	-
657	Cat Arm River	2	0	Nil	Nil	-
658	Cat Arm River	2	0	Nil	Nil	-
662	Little Harbour Deep River	2	0	Nil	Nil	-
663	Little Harbour Deep River	2	0	Nil	Nil	-
665	8.0 km S.W. Great Harbour Deep	2	0	Nil	Nil	-
669	Cloud River	2	0	Nil	Nil	-
670	Bide Arm	2	0	Nil	Nil	-
671	6.4 km E. Roddickton	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
672	6.4 km W. Conche	2	33	Nil	L	-
673	8.0 km N.E. Roddickton	2	0	Nil	Nil	-
674	Coles Pond	2	0	Nil	Nil	-
675	6.4 km N. Roddickton	2	0	Nil	Nil	-
676	Roddickton Rd.	2	0	Nil	Nil	-
677	Beaver Brook	2	0	Nil	Nil	-
678	Northwest Arm	2	0	Nil	Nil	-
679	Boony Lake	2	0	Nil	Nil	-
680	Roddickton Rd.	2	0	Nil	Nil	-
681	8.0 km W. Boony Lake	2	0	Nil	Nil	-
682	Middle Gulch Bk.	2	0	Nil	Nil	-
683	Leg Pond	2	0	Nil	Nil	-
684	Leg Pond	2	0	Nil	Nil	-
685	6.4 km N. Castors River	2	0	Nil	Nil	-
686	Squid Cove	2	0	Nil	Nil	-
687	9.6 km E. Port aux Choix	2	0	Nil	Nil	-
688	East River	2	0	Nil	Nil	-
689	Western Brook Pond	2	0	Nil	Nil	-
690	8.0 km S. Western Brook Pond	2	0	Nil	Nil	-
691	Hawkes Bay Rd.	2	0	Nil	Nil	-
692	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
693	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
694	Eastern Blue Pond	2	0	Nil	Nil	-
695	Little Brook Pond	2	0	Nil	Nil	-
696	River of Ponds	2	0	Nil	Nil	-
697	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
698	Western Blue Pond	2	0	Nil	Nil	-
699	Hawkes Bay Logging Rd.	2	0	Nil	Nil	-
700	8.0 km S. River of Ponds Lake	2	0	Nil	Nil	-
701	9.6 km N. Bellburns	3	202	Nil	L	-
702	8.0 km N.E. Bellburns	2	0	Nil	Nil	-
703	Bellburns	2	0	Nil	Nil	-
704	4.8 km E. Bellburns	2	0	Nil	Nil	-
705	8.0 km N. Daniel's Harbour	2	0	Nil	Nil	-
706	Brians Pond	2	0	Nil	Nil	-
707	Portland Creek	2	0	Nil	Nil	-
708	8.0 km N. Parsons Pond	2	82	Nil	Nil	-
720	Benoit's Cove	3	53	Nil	L	-
721	Frenchman's Cove	2	0	M	Nil	-
722	Gillams	3	0	M	Nil	-
723	Gillams Bk.	2	0	M	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
724	McIvers	2	77	M	L	-
725	Frenchman's Pd.	2	0	Nil	Nil	-
726	3.2 km S. Cox's Cove	2	0	Nil	Nil	-
727	Old Woman Hd.	2	0	Nil	Nil	-
729	Halfway Point	2	0	Nil	Nil	-
730	Serpentine Lake Rd.	2	0	L	Nil	-
732	Serpentine Lake Rd.	2	0	L	Nil	-
733	Serpentine Lake	2	0	L	Nil	-
738	Pinchgut Lake	3	0	Nil	Nil	-
743	George's Lake	3	0	Nil	Nil	-
744	George's Lake	3	0	L	Nil	-
747	4.8 km S. Serpentine Lake	2	0	Nil	Nil	-
748	Serpentine Lake	2	0	Nil	Nil	-
749	Middle Blue Hill Bk.	2	0	Nil	Nil	-
754	Spruce Bk.	3	0	Nil	Nil	-
755	George's Lake	3	18	Nil	L	-
756	Island Pond	3	0	L	Nil	-
757	Grand Lake Bk.	3	25	L	L	-
758	Moose Pond	3	0	L	Nil	-
759	Gallants	3	0	L	Nil	-
760	Gallants	3	0	Nil	Nil	-
764	N. of Stephenville	2	0	Nil	Nil	-
771	Fox Island River	2	0	Nil	Nil	-
772	Fox Island River	3	391	S	M	-
773	Romaines Bk.	2	0	Nil	Nil	-
776	Jack Burke Pond	2	0	Nil	Nil	-
777	Mistaken Pond	3	0	Nil	Nil	-
778	Trout Bk.	2	0	Nil	Nil	-
780	Hare Hill	3	0	Nil	Nil	-
782	Bottom Bk.	3	0	L	Nil	-
783	Bottom Bk.	2	0	Nil	Nil	-
784	Bottom Bk.	2	0	Nil	Nil	-
785	Southwest Bk.	2	0	Nil	Nil	-
786	Southwest Bk.	2	0	Nil	Nil	-
787	Little Barachois Bk.	2	0	Nil	Nil	-
788	Little Barachois Bk.	2	0	Nil	Nil	-
791	Bottom Bk.	2	0	Nil	Nil	-
792	Southwest Bk.	2	0	Nil	Nil	-
793	Barachois Prov. Park	2	0	Nil	Nil	-
794	Barachois Prov. Park	3	345	M	M	-
795	Mattis Pt. Pond	2	35	Nil	L	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoliation	Egg-mass category*	Overwintering larvae category
797	Long Gull Pond	3	192	Nil	L	-
798	Blanche Bk.	2	0	L	Nil	-
799	Cold Bk.	2	78	Nil	L	-
800	4.8 km S. Point au Maul	2	0	Nil	Nil	-
802	Piccadilly	2	0	L	Nil	-
803	4.8 km N. Ship Cove	2	69	L	L	-
804	Harry's Bk. (Port au Port)	2	41	M	L	-
805	Victor's Bk.	1	400	S	S	-
806	6.4 km E. Mainland	3	322	S	M	-
807	Barachois Bk.	2	0	L	Nil	-
809	Flat Bay Rd.	3	252	Nil	L	-
810	Steel Mtn. Rd.	2	0	M	Nil	-
811	Steel Mtn. Rd.	3	312	M	L	-
812	Steel Mtn. Rd.	2	739	M	S	-
813	Flat Bay Bk.	2	0	Nil	Nil	-
814	Flat Bay Bk.	2	0	Nil	Nil	-
815	Middle Bk.	2	165	L	M	-
817	Fischell's River	3	413	M	M	-
818	Fischell's River	2	0	Nil	Nil	-
819	Mount Howley	2	0	M	Nil	-
820	Fischell's River	2	0	Nil	Nil	-
821	6.4 km S.E. Fischell's (TCH)	3	550	L	M	-
822	Robinson's River	3	167	L	L	-
823	Robinson's River	2	131	L	L	-
825	Robinson's River	2	0	Nil	Nil	-
826	Robinson's River	2	0	Nil	Nil	-
827	Barachois Bk.	2	37	Nil	L	-
828	Barachois Bk.	2	0	Nil	Nil	-
829	Camp 180 Rd. (Crabbes River)	2	19	Nil	L	-
830	Jeffery's	3	840	M	S	-
831	Jct. St. Fintan's Rd. & TCH	2	0	Nil	Nil	-
832	Crabbes River Rd.	2	39	Nil	L	-
833	Camp 180 Rd.	2	0	Nil	Nil	-
834	Crabbes River	2	81	Nil	L	-
835	Crabbes River	2	0	Nil	Nil	-
836	Crabbes River	2	0	Nil	Nil	-
837	6.4 km E. Codroy Pond	2	0	Nil	Nil	-
838	Highland River	2	0	L	Nil	-
839	Butter Bk.	1	819	L	S	-
840	1.6 km N.E. Codroy Pond (TCH)	2	0	Nil	Nil	-
841	North Branch	2	0	Nil	Nil	-
842	Codroy Pond	2	44	L	L	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
843	4.8 km S.W. Codroy Pond	2	44	Nil	L	-
844	6.4 km N. Coal Bk.	2	87	L	L	-
845	South Branch	1	403	L	S	-
847	4.0 km S. Upper Ferry	1	929	L	S	-
848	Mummichog Prov. Park	1	480	L	S	-
849	4.0 km N. St. Andrews	2	109	Nil	L	-
873	Nipper's Hr. Rd.	2	0	L	Nil	-
884	East Brook (Baie Verte Pen.)	2	0	L	Nil	-
885	8.0 km N. Cross Country Pond	2	0	L	Nil	-
887	Bear Cove	2	0	Nil	Nil	-
888	6.4 km S. Pumbley Cove	2	0	Nil	Nil	-
889	Big Chouse Bk.	2	0	Nil	Nil	-
890	George's Cove	2	0	Nil	Nil	-
892	Conical Hill	2	0	Nil	Nil	-
893	4.8 km S.W. Glide Lake	2	0	Nil	Nil	L
894	12.8 km S. Sop's Arm	2	0	Nil	Nil	-
896	Hughes Brook	3	13	Nil	L	L
898	3.2 km N. Governor's Pond	3	0	Nil	Nil	-
899	East Lomond River (GMNP)	2	0	Nil	Nil	-
900	Western Brook Hill (GMNP)	2	0	Nil	Nil	-
901	4.8 km N. St. Paul's Inlet (GMNP)	2	0	Nil	Nil	-
902	Parson's Pond	2	0	Nil	Nil	-
903	Western Brook Pond	2	0	Nil	Nil	-
904	8.0 km S.W. Western Brook Pond	2	0	Nil	Nil	-
905	4.8 km W. Brian's Pond	2	0	Nil	Nil	-
906	8.0 km N. Parson's Pond	2	0	Nil	Nil	-
907	11.2 km N.E. Parson's Pond	2	0	Nil	Nil	-
908	North Brook (Gallants area)	2	0	Nil	Nil	-
909	South Branch River	2	0	Nil	Nil	-
1112	Silver Pond	2	0	L	Nil	-
1113	Bottle Lake	2	0	Nil	Nil	-
1114	Little Grand Lake	2	0	Nil	Nil	-
1115	Grand Lake	2	0	Nil	Nil	-
1116	Grand Lake	2	0	Nil	Nil	-
1116A	S. of Corner Brook	2	0	Nil	Nil	-
1118	Eastern Lake	2	0	Nil	Nil	-
1119	Steady Brook	2	0	Nil	Nil	-
1120	Steady Brook	2	0	Nil	Nil	-
1121	Grand Lake	-	-	-	-	L
1122	Grand Lake	2	0	L	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
1123	Island Pond	2	0	Nil	Nil	-
1146	East Brook (Baie Verte Pen.)	2	0	Nil	Nil	-
1147	11.2 km S. South Brook	2	0	L	Nil	M
1148	11.2 km S.E. Baie Verte	2	0	Nil	Nil	-
1150	Wild Cove Pond	3	0	Nil	Nil	L
1151	Wild Cove Pond	3	0	Nil	Nil	-
1152	Black Lake	2	0	Nil	Nil	-
1153	Black Lake	2	0	L	Nil	L
1156A	Kitty's Brook	2	0	Nil	Nil	-
1159	Sheffield Lake	2	0	Nil	Nil	-
1160	Sheffield Lake Road	2	53	Nil	L	-
1161	Sheffield Brook	2	0	Nil	Nil	-
1162	Birchy Lake	2	0	Nil	Nil	-
1163	Birchy Lake	2	0	Nil	Nil	-
1164	Chain Lakes Road	2	0	S	Nil	-
1165	Chain Lakes Road	2	0	Nil	Nil	-
1167	Kelvin Brook	2	0	Nil	Nil	-
1168	Howley Woods Road	2	0	Nil	Nil	-
1169	Sandy Lake	2	0	Nil	Nil	-
1170	Sandy Lake	2	0	Nil	Nil	-
1171	Lake Buck	2	0	Nil	Nil	L
1172	Upper Indian Pond	2	0	Nil	Nil	-
1173	Saltwater Pond	2	0	Nil	Nil	-
1174	Jackson's Arm	2	0	Nil	Nil	-
1175	Sop's Arm	2	0	Nil	Nil	-
1176	Adies Lake	3	0	Nil	Nil	-
1177	Adies Lake	3	0	Nil	Nil	-
1178	Bonne Bay Pond	3	0	Nil	Nil	-
1179	Grand Lake	2	48	Nil	L	L
1180	Glide Lake	2	138	L	L	-
1181	Glide Lake	2	0	Nil	Nil	L
1182	Nicholsville	3	0	Nil	Nil	-
1183	North Lake	3	0	Nil	Nil	-
1184	North Lake	3	0	Nil	Nil	-
1185	Trout River	3	0	Nil	Nil	-
1186	Hughes Lake	3	0	Nil	Nil	L
1187	Hughes Lake	2	0	Nil	Nil	L
1188	S. of North Lake	3	0	Nil	Nil	-
1189	Roddickton Rd.	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
1190	Leg Pond	2	0	Nil	Nil	-
1191	Leg Pond	2	0	Nil	Nil	-
1192	Cloud River	2	0	Nil	Nil	-
1193	3.2 km N.E. Wild Cove	2	0	Nil	Nil	-
1194	Main Brook	2	0	Nil	Nil	-
1195	Main Brook	2	0	L	Nil	-
1196	Main Brook	2	0	L	Nil	-
1197	Main Brook	2	0	Nil	Nil	-
1198	6.4 km W. Second Salmon Pond	2	0	L	Nil	-
1199	Salmon River	2	0	L	Nil	-
1200	8 km N. Bonny Lake	2	0	L	Nil	-
1201	Ten Mile Lake	2	0	Nil	Nil	-
1202	Roddickton Road	2	0	S	Nil	-
1203	Round Pond	2	0	Nil	Nil	-
1204	Round Pond	2	0	M	Nil	-
1205	Ten Mile Pond	2	48	L	L	-
1206	12.8 km N.E. Round Pond	2	0	Nil	Nil	-
1207	Round Pond	2	0	L	Nil	-
1208	Round Pond	2	0	Nil	Nil	-
1209	Ten Mile Pond	2	0	Nil	Nil	-
1210	Ten Mile Pond	2	0	Nil	Nil	-
1211	Ten Mile Pond	2	0	Nil	Nil	-
1212	Ten Mile Pond	2	47	Nil	L	-
1213	Ten Mile Pond	2	0	Nil	Nil	-
1214	Jct. Bottle Pond Rd. & TCH	3	0	L	Nil	-
1215	Whites Road	2	0	Nil	Nil	-
1216	Southwest Bk. Road	2	0	Nil	Nil	-
1217	Romaines River	2	16	Nil	Nil	-
1218	4.8 km S. Fox Island River	2	67	Nil	Nil	-
1219	Fox Island River	2	0	L	Nil	-
1220	N. Fox Island River	2	76	Nil	L	-
1221	Man of War Cove	2	0	M	Nil	-
1222	Campbells Creek	2	0	M	Nil	-
1223	Lower Cove	2	0	M	Nil	-
1224	Sheaves Cove	2	71	S	L	-
1225	Mainland	2	93	S	L	-
1226	Red Brook	3	213	S	L	-
1227	4.8 km W. North Brook	2	0	Nil	Nil	-
1228	Broom Brook	2	0	Nil	Nil	-
1229	Coal Brook	2	86	Nil	Nil	-

Cont'd ...

Appendix I. - Continued

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoliation	Egg-mass category*	Overwintering larvae category
1230	Codroy Valley	2	0	Nil	Nil	-
1231	O'Regan's	2	36	Nil	L	-
1232	Overfalls Brook	3	359	L	M	-
1233	3.2 km E. Doyles	2	0	L	Nil	-
1234	Tompkins	1	816	M	S	-
1235	St. Andrews	2	0	L	Nil	-
1236	Croque Rd.	2	82	S	L	-
1237	Croque Rd.	2	149	L	M	-
1238	Tom Roses Pond	3	409	S	M	-
1239	4.8 km N.E. Tom Roses Pond	3	141	S	L	-
1240	6.4 km E. Burnt Village	3	290	S	L	-
1326	Logging School Road	2	0	Nil	Nil	-
1327	Logging School Road	2	0	Nil	Nil	-
1350	1.6 km N.W. Stag Lake	2	0	Nil	Nil	-
Average per branch			24			
LABRADOR						
2001	Kenamu River	2	0	Nil	Nil	-
2002	Kenamu River	2	125	Nil	L	-
2003	Kenamu River	2	0	L	Nil	-
2004	Mud Lake	2	143	L	L	-
2005	Traverspine River	2	0	L	Nil	-
2006	Traverspine River	2	0	Nil	Nil	-
2007	Caroline Brook	2	0	Nil	Nil	-
2008	Caroline Brook	2	0	Nil	Nil	-
2009	Churchill Road	2	0	Nil	Nil	-
2010	Goose River	2	0	Nil	Nil	-
2011	Goose River	2	0	Nil	Nil	-
2012	Goose River	2	0	Nil	Nil	-
2013	Muskrat Island	2	0	Nil	Nil	-
2014	Caroline Brook	2	0	Nil	Nil	-
2015	McKenzie Brook	2	0	Nil	Nil	-
2016	McKenzie Brook	2	0	Nil	Nil	-
2017	Churchill River	2	0	Nil	Nil	-

Cont'd ...

Appendix I. - Concluded

Plot no.	Plot location	No. branches sampled	Cumulative totals (No. egg-masses per 10 m^2 foliage)	1979 defoli-ation	Egg-mass category*	Over-wintering larvae category
2018	Pinus River	2	0	Nil	Nil	-
2019	Beaver River	2	0	Nil	Nil	-
2020	Susan River	2	0	Nil	Nil	-
2021	Caribou River	2	0	Nil	Nil	-
Average per branch			6			

*

Defoliation	Egg-mass category	Overwintering larval category
L = Light = 0-25	L = Light	L = Low = 1-108
M = Moderate = 26-75	M = Moderate	M = Medium = 109-323
S = Severe = 76-100	S = Severe	H = High = 324-700
		E = Extreme = 700+